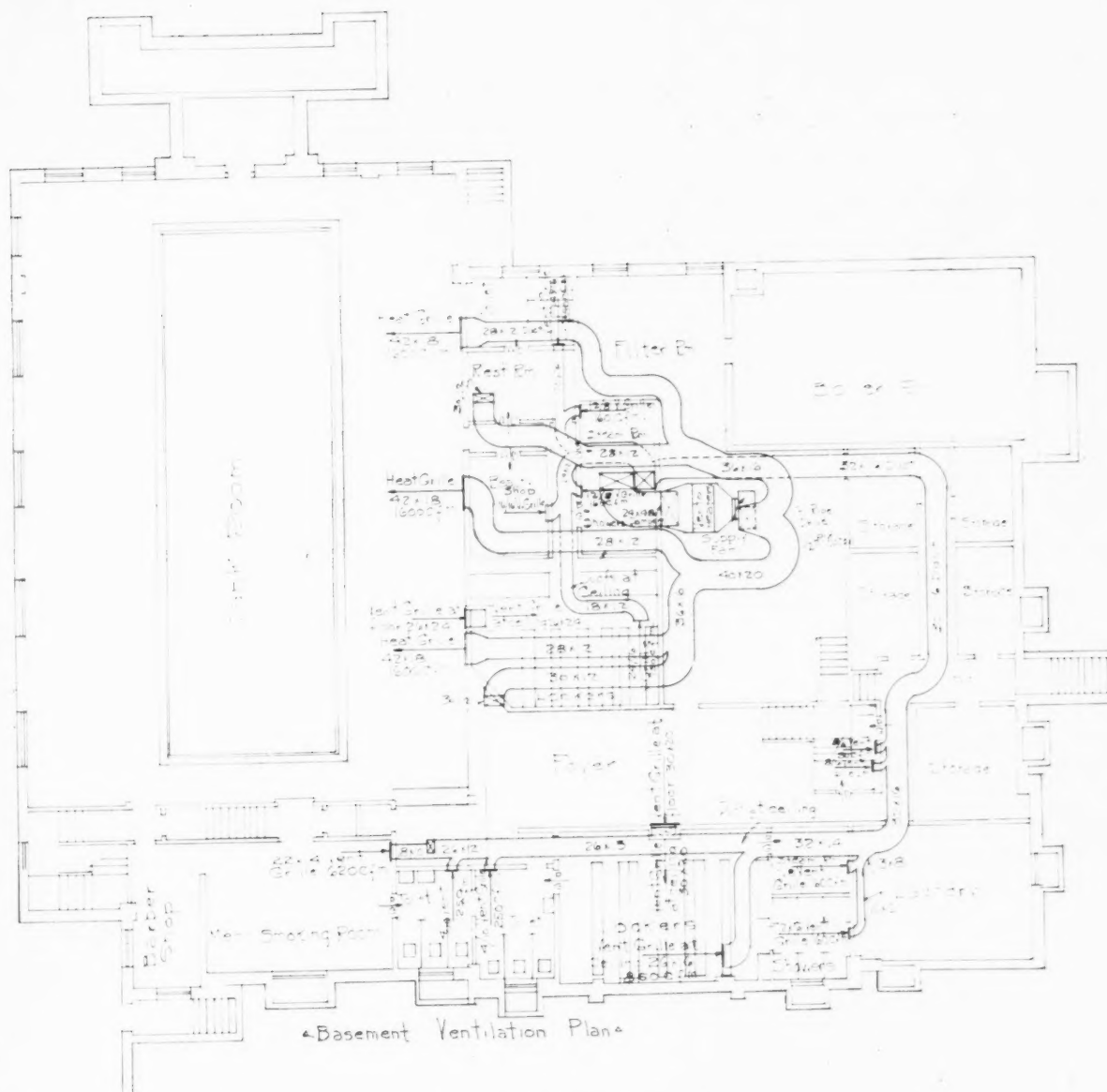


# AMERICAN ARTISAN

WARM AIR HEATING • SHEET METAL  
CONTRACTING • AIR CONDITIONING



ESTABLISHED  
8 8 0

JULY,  
1932

FOR BEAUTY AND UTILITY...



*make your selection*

**ENDURO**

In Laureldale Cemetery stands a chime tower erected in memory of the soldiers of Berks County, Pa. who served their country in various wars. The pyramidal roof and the Grecian urn surmounting it are made of ENDURO, Republic's Perfected Stainless Steel. The roof was fabricated by Frantz & Luppold Co., Reading, Pa. The urn was hand hammered by Loeben Ornamental Iron Works, Philadelphia.

A very striking ventilator adorns the roof of the Civic Theatre, Kalamazoo, Mich. It is the work of the Kalamazoo Sheet Metal Mfg. Co. and is made entirely of ENDURO.

Work of this character calls for something better than ordinary sheet materials—a metal that combines lustrous never-changing beauty with long life and freedom from the marring effects of corrosion. For such work ENDURO is ideal. And any metal worker can fabricate it with profit to himself.

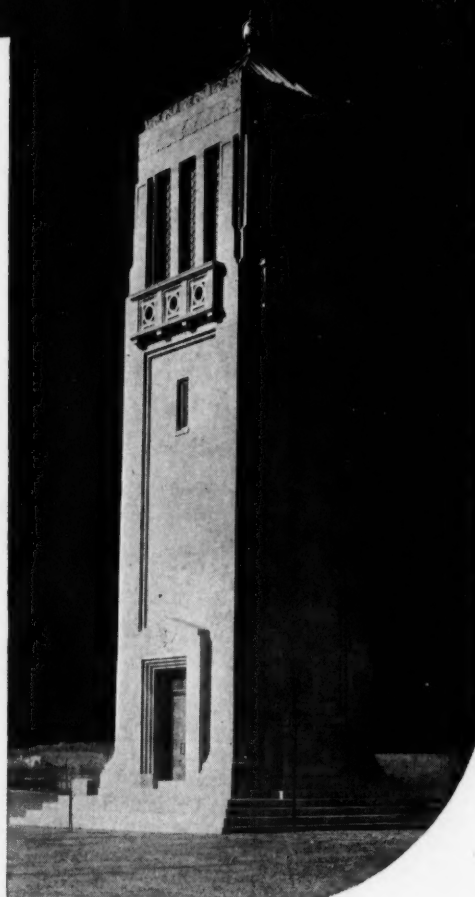
Let us send you a copy of a new folder telling the possibilities of ENDURO and complete working information.

CENTRAL ALLOY DIVISION . . MASSILLON, OHIO

**REPUBLIC STEEL CORPORATION**



**ENDURO**  
REPUBLIC'S PERFECTED  
STAINLESS STEEL



Licensed under Chemical  
Foundation Patents Nos.  
1316817 and 1339378.

# GET READY...NOW...

**for the business of replacing old-fashioned warm air furnaces with MW "Automatic Weather Control Units" that furnish heat in winter, cooling in summer, at surprisingly low cost**

Many thousands of service-worn warm-air furnaces simply **MUST** be replaced this Fall. A large share of this business will be secured by MW dealers ready to demonstrate the many exclusive advantages of the famous MW "Automatic Weather Control Units," which supply filtered, scientifically humidified warm air in Winter, and circulate cooled, clean air in Summer.

Every home now equipped with an old-fashioned warm-air furnace is a logical prospect for the MW "Automatic Weather Control Unit" which, heats, cools, humidifies and air-conditions

tions with automatic precision and unchanging efficiency.

Merchandising MW Oil-Burning Utilities—including "Automatic Weather Control Units," Automatic Boiler Units for Steam and Hot Water Heating, Automatic Water Heaters, and Oil-Burning Cooking Ranges—is a profitable year-round business.

The coupon below will bring full information about the MW line on which dealers are certain to cash in this Fall.

*This "Automatic Weather Control Unit" finds a ready market in every community. It is a "matched" unit including oil burner, all-steel combustion chamber, thermostatic control, blower, humidifier, etc. Listed as Standard by Underwriters' Laboratories.*

## MW AUTOMATIC WATER HEATERS

Domestic and commercial sizes. For houses, apartments, office buildings, schools, shops, factories. Single and battery installations. Hot water at lowest cost. Listed as Standard by Underwriters' Laboratories.

# MW

## OIL BURNING • AUTOMATIC WEATHER CONTROL UNITS



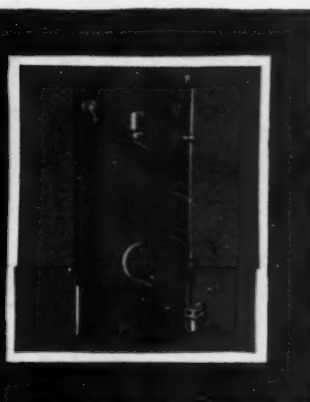
## MW AUTOMATIC BOILER UNITS

Heating with steam or hot water. Incorporate the amazing oil-burner development—the new, super-efficient MW Gyro-Flame Burner. Small and large capacities. Listed as Standard by Underwriters' Laboratories.



## MW "AUTOMATIC WEATHER CONTROL UNIT"

Round type, for greatest space economy. Operating efficiency and economy identical with square type shown above. Warms in winter, cools in summer—automatically.—Listed as Standard by Underwriters' Laboratories.



## MW OIL-BURNING COOKING RANGES

Twotypes—for homes, restaurants, lunch-rooms, roadside stands, hotels, clubs, etc. Quick, clean, uniform, controlled heat—the better, more economical way of cooking, frying, roasting, baking.



**MOTOR WHEEL CORPORATION, Heater Division, LANSING, MICH., Dept. A.**

Please send me full information describing the MW line of oil-burning utilities, and explaining its sales and profit opportunities.

Name.....Address.....City.....State.....



Covering All Activities  
in  
Gravity Warm Air Heating  
Forced Warm Air Heating  
Sheet Metal Contracting  
Air Conditioning  
Merchandising  
Ventilating

# AMERICAN ARTISAN

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VOL. 101

No. 13

JULY, 1932

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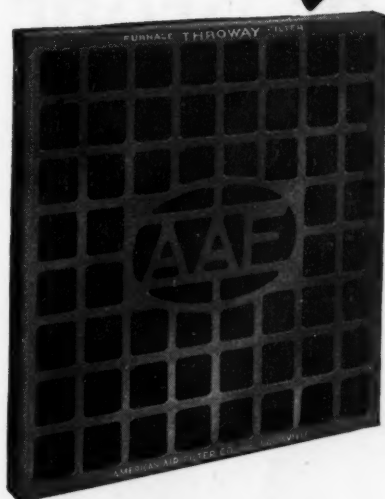
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**THROWAWAY**

Filter pad contained in cardboard casing. To be thrown away and replaced with new unit when filter has collected its dust load.

**RE-NU**

Filter pad contained in metal casing with expanded metal covers, easily renewed by removing cover.

# NEW FILTERS

*of* **HIGH CLEANING EFFICIENCY -**

**LOW FIRST COST -**

**SIMPLIFIED MAINTENANCE**

**T**HESE two new American Air Filters are designed especially for use with warm air heating systems, air conditioning units, room coolers and unit ventilators.

Built by the pioneers of air filtration they set a new standard both for cost and performance.

The filtering medium is fabricated split wire woven into pads by a new process. This material has a low initial resistance and a high efficiency in dust removal even with low air velocities which make them particularly well adapted both to gravity circulation and forced warm air systems.

Made in standard sizes 20" x 20" x 2" and 16" x 25" x 2"—special sizes in quantity for manufacturers of heating or air conditioning equipment.

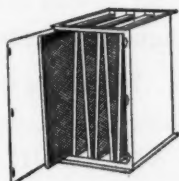
*American Air Filters are made to Fit  
Every Air Conditioning Need*

## American Air Filter Company, Inc.

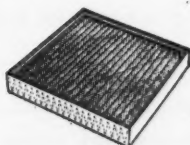
113 Central Avenue,

In Canada, MIDWEST CANADA, LTD., Montreal, P. Q.

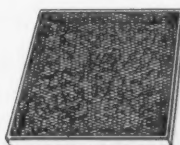
Louisville, Ky.



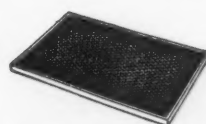
**AIRMAT CABINET FILTER**  
A complete filter cabinet using standard 24" x 24" Airmat filter sheets, ready for fan housing and duct connections.



**AMERICAN DRIFILTER**  
Made in standard sizes, 20" x 20" x 3" and 16" x 25" x 3" with renewable refill. Has practically the same capacity and space requirement as the Reed E-Z-Kleen Filter.



**REED E-Z-KLEEN FILTER**  
An improved viscous type furnace filter. Made in two standard sizes, 20" x 20" x 2 1/2" and 16" x 25" x 2 1/2".



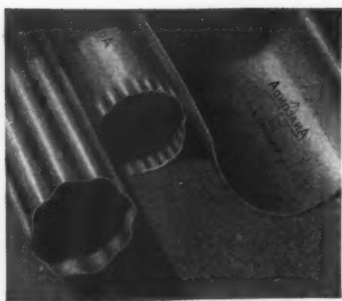
**AMERICAN WAFER FILTER**  
Made in standard sizes 20" x 20" x 1 1/4" and 16" x 25" x 1 1/4". For gravity circulation or booster fan systems where low resistance is an essential requirement.

# From the standpoint of profit *Recommend Copper*



Next time you quote on  
a sheet metal job . . . say  
this to your customer:—

*"Copper will save far more than  
its slightly higher first cost"*

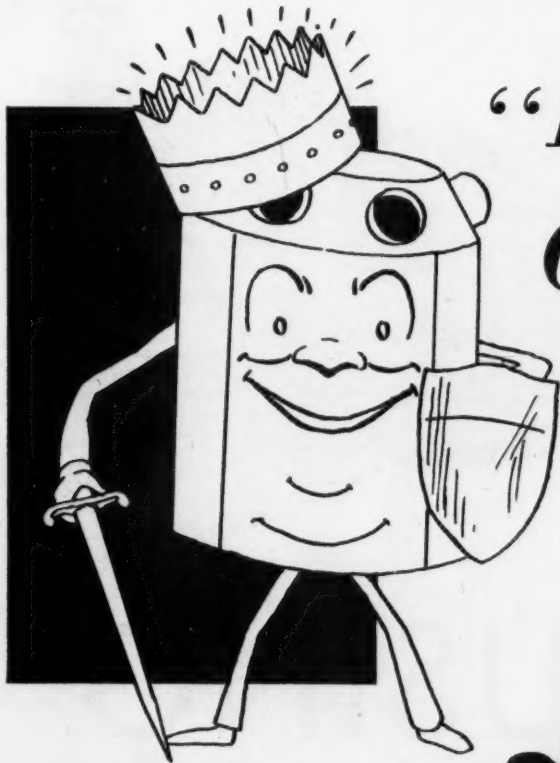


MOST home builders know that metal that rusts sooner or later causes expense. They know, too, that Copper *cannot* rust. But the typical home owner does not fully appreciate that sheet metal work of Anaconda Copper costs them so little more than rustable metal . . . for gutters and rainpipes, about \$35 (national average) for a 7-room Colonial house. Nor does he always realize that the cost of one rust repair job is often more than that amount!

It follows, then, that most people will pay a fair price for Copper metal work, when they understand the economies it offers. Remember to say to your next customer, "Copper will save you far more than its slightly higher first cost."

Leading sheet metal supply houses carry Anaconda Copper . . . backed by the industry's best known name . . . in sheets, rolls and Economy strips, and Copper gutters, leaders, elbows and shoes trade-marked ANACONDA. The American Brass Company, General Offices: Waterbury, Connecticut.

# ANACONDA COPPER



*“Bring on your  
Competition . . .*

*I’m Ready”*

*says . . .*

# ***Agricola*** **“SUPREME”**



**“FURNACE WARMTH  
FROM THE  
SUNNY SOUTH”**

“I’m tough. Tough to beat—that’s what all my rivals say.

“I’ve got the stuff in me that people like—quality in materials and workmanship; advanced and more efficient design; many distinctive construction features. And no other furnace, quality considered, sells at such interesting prices. Again I say, I’m a tough match for any competition.

“Today, the people in your community are demanding more for their money. Let me show you how you can meet this demand. Write for details.”

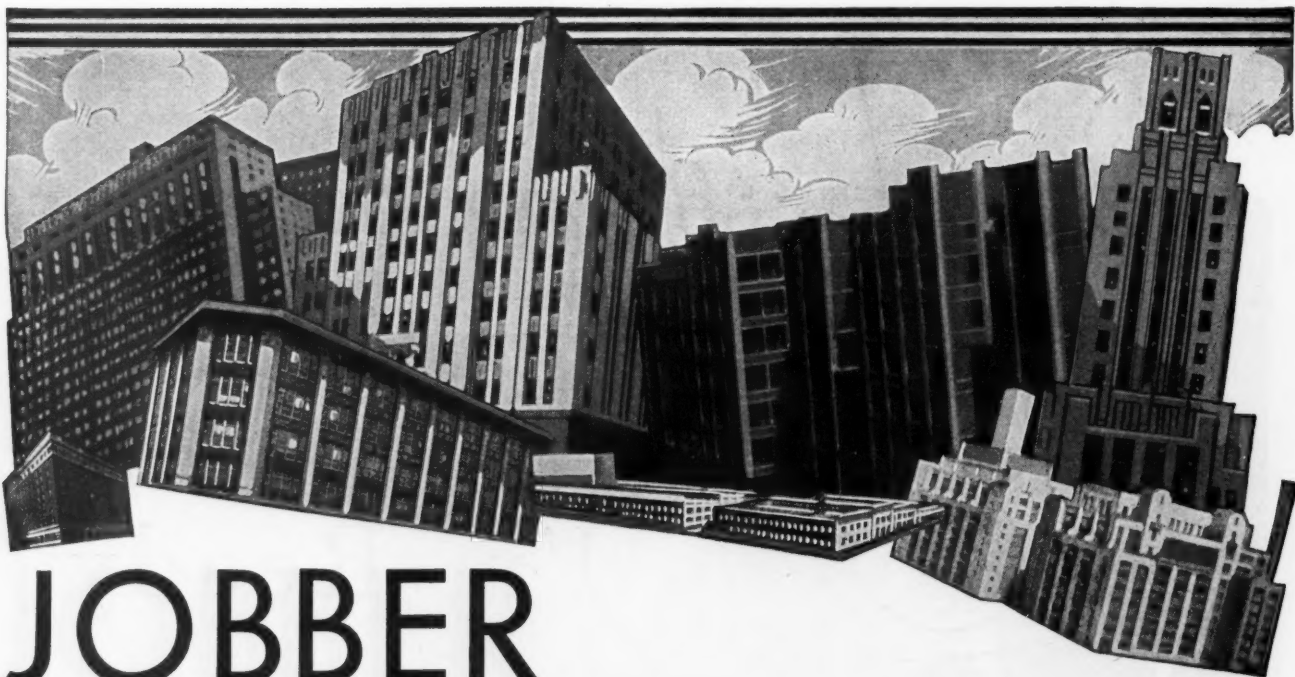
—Agricola “Supreme”  
LEADER OF FURNACES

**AGRICOLA FURNACE CO., Inc.**

**Gadsden, Alabama**

*Offices in Principal Cities*





# JOBBER WAREHOUSING EVERYWHERE . . .

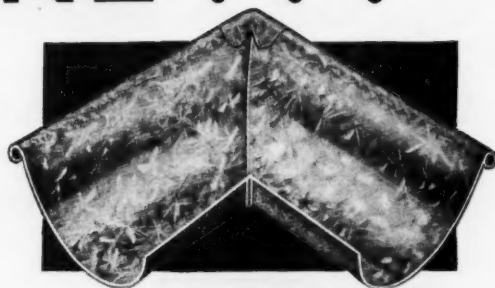
To insure Barnes Quality with Sudden Service, ample stocks are Warehoused Everywhere.

As Barnes Products Build Prestige and Profits for Sheet Metal Contractors—SO—will you find the Barnes Jobber the Progressive Distributor in every community.

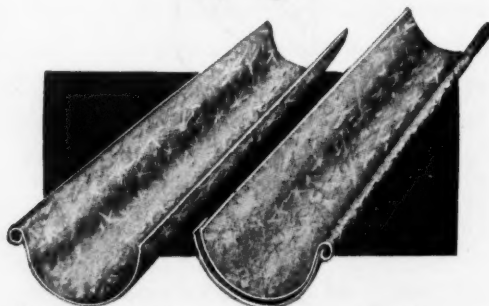
Place all your business with the Barnes Jobber in your locality and be assured of Quality with Service at fair Prices.



*The BARNES Super-Self-Draining End and Outlet with Lock-Tite End Cap.*



*The BARNES Super-Miter. Uncomparably Rigid.*



*BARNES—that specially strength constructed Eaves Trough with the square, firm edge, meets all non-sagging test requirements.*

**Full of Merit • That is why**  
***Barnes* Dominates**

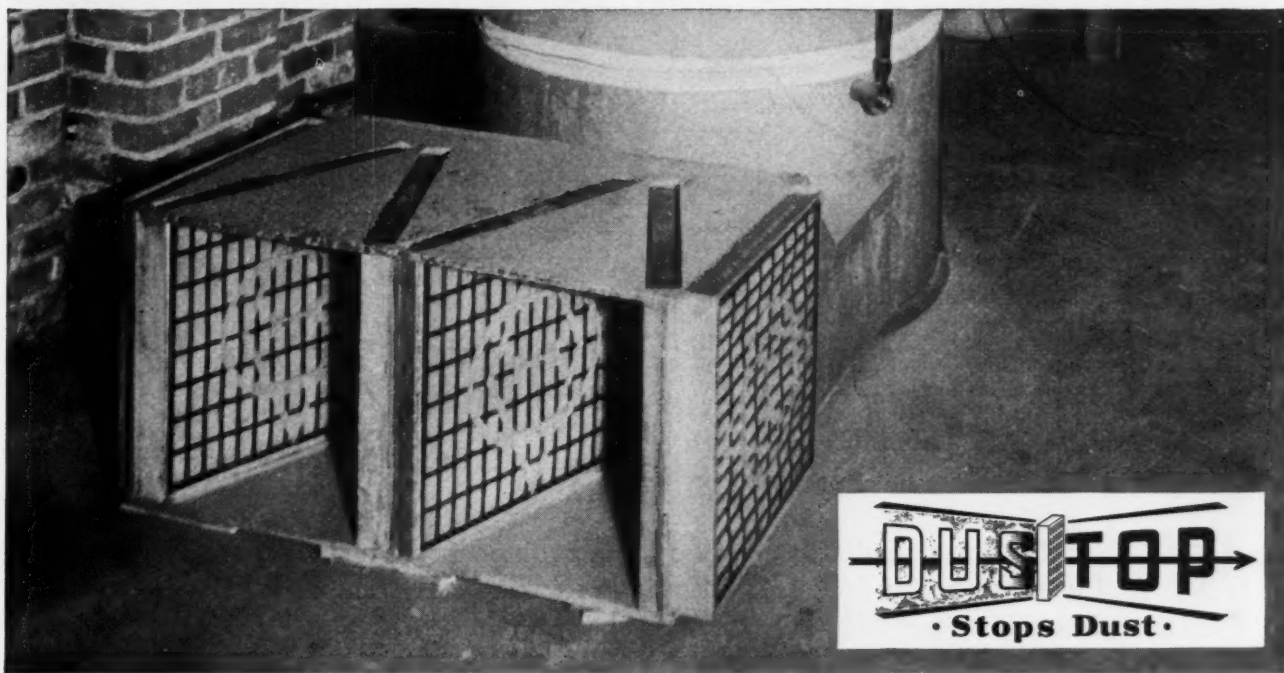
4425 W. 16th Street

**BARNES METAL PRODUCTS COMPANY**

*Manufacturers of  
Conductor Pipe, Elbows, Eaves Trough and Fittings. All Sizes. All Metals.*

Chicago, Illinois

# 8,500,000 PROSPECTS *and profit in every job*



*A typical installation of DUSTOP filter units on a standard type of warm air furnace.*

● Dust and dirt circulating from 8,500,000 furnaces! 8,500,000 gravity warm air furnaces just waiting for aggressive dealers to install gravity filters!

It's your job to make dirty furnaces clean. You can do this job at a profit—with DUSTOP.

DUSTOP retails to the householder at \$1.50. This low figure enables you to use as many of them as are necessary to do an effective job.

Dust is one of the gravest concerns of the modern housewife. There's a smooth selling approach for you. Tell housewives that you can stop furnaces from spreading dust and dirt and you'll get into as many basements as the meter man.

DUSTOP filters will live a whole heating season and more. DUSTOP is the only filter that will do a real job of cleaning on low velocities—as low as 25 feet per minute. And

average velocities will run around 140 feet per minute on a moderately cold day.

The new DUSTOP glass wool filter offers furnace dealers a fine opportunity to build up a volume of profitable business.

For more detailed information mail the coupon today. You will receive a booklet giving complete information on DUSTOP installation both for gravity furnaces and for the revamping of gravity jobs for mechanical circulation of filtered and heated air. Owens-Illinois Glass Company, Toledo, Ohio.

OWENS-ILLINOIS GLASS COMPANY (Industrial Materials Division)  
Toledo, Ohio

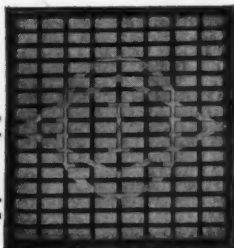
Please send me your booklet "Jobs To Do at a Profit."

Name \_\_\_\_\_

Address \_\_\_\_\_

*Furnace filters for gravity and  
mechanical warm air furnaces*

**OWENS-ILLINOIS**



*distributed through jobbers and  
manufacturers everywhere.*

**AIR FILTERS**

# NOW'S THE TIME

FOR



TO MAKE MONEY  
*for* YOU!

**E**CONOMY is the word that gets the business these days. And where can you find such downright economy as in GLOBE BRAND Sheet Metal Building Products?

GLOBE Sheet Metal is the material of low first cost and long, dependable service. Every GLOBE job you do is a standing advertisement in your community of your workmanship and your quality. For it stays on the job long after ordinary sheet steel has had to be replaced. There's a reason for this. It's in the METAL. GLOBE completely controls the manufacture of its metal, from the selection of the raw materials to the finished formed product. Sell GLOBE quality and make money . . . now . . . in 1932.

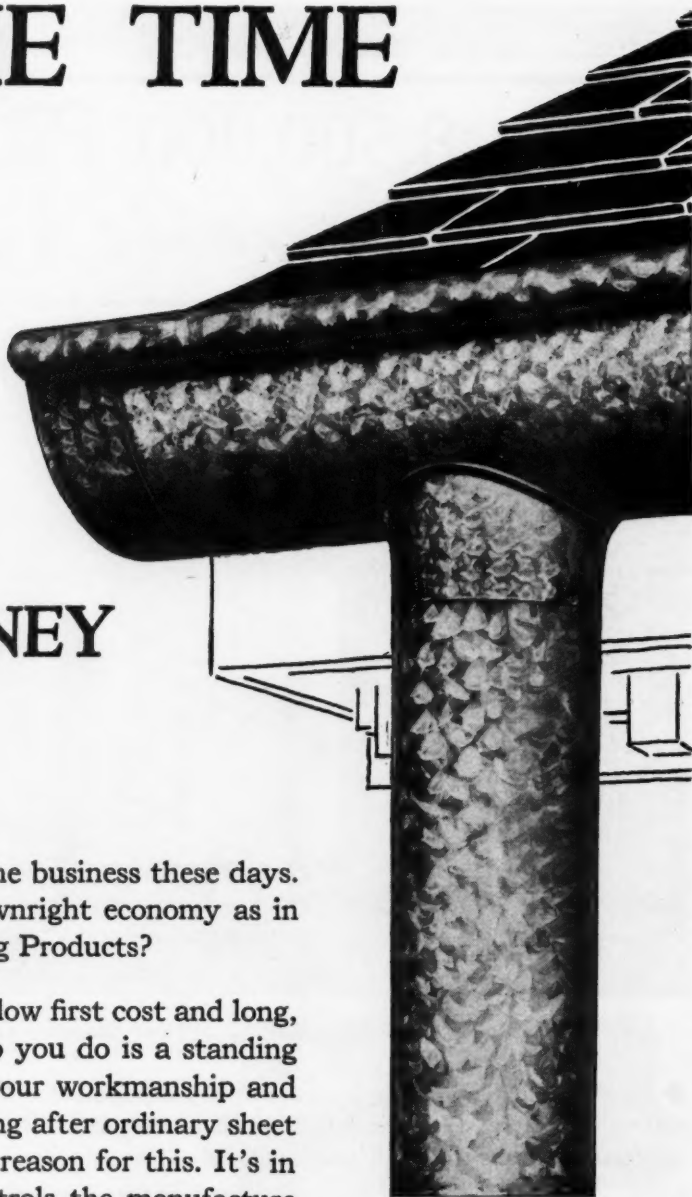
There's a GLOBE product for every sheet metal building requirement. Large stocks always maintained ready for immediate shipment.

# SHEET METAL

## Building Products

**The Globe Iron Roofing & Corrugating Company  
Cincinnati, Ohio**

*Fabricators of Zinc Institute—Seal of Quality—Two Ounce Coated Galvanized Corrugated Roofing*





# Revere Leadtex



St. Pascal's Church, Chicago. Architect, B. J. Hutton; Associate Architect, Raymond Gregori; both of Chicago.

*...can get you jobs like this!*

In churches, in office buildings, in homes, in store fronts . . . the trend toward ornamental sheet metal work is gaining speed. A great deal of this work is done in Revere Leadtex . . . Revere Sheet Copper, lead-coated.

St. Pascal's Church in Chicago is a fine example of this. The ornamental gutters, the stamped leaders and leaderheads are all of Revere Leadtex.

Revere Leadtex is preferred for this type of work, because it has definite advantages. It is light, permanent, workable . . . being sheet copper. It lends itself to deep stamping and decorative handling . . . in a limitless range. It has the color of true lead.

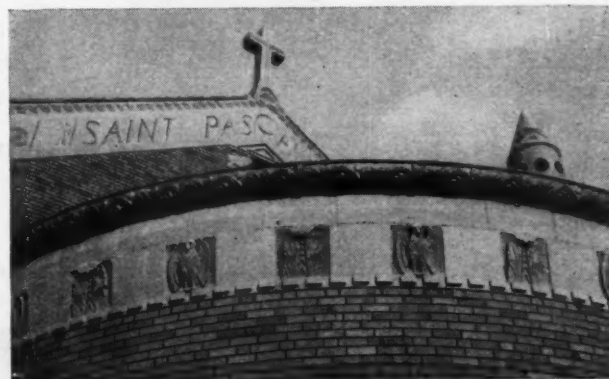
Not only is Revere Leadtex first choice . . . but it actually starts jobs. To the sheet metal contractor, Revere Leadtex is an active business producer. What's more, it's profitable business.

Why not let Revere Leadtex get jobs for you?

For further information about Revere Leadtex as well as Revere Sheet Copper address Revere Copper and Brass Incorporated, 230 Park Avenue, New York City.



Notice the fine appearance of the ornamental leaders and leaderheads. Also the decorative quality of the gutters as shown in photo below.



Sheet Metal Work by Wagner Bros. Cornice Co., Chicago. Stamping by Friedley Voshardt Co., Chicago.

# Revere Copper and Brass INCORPORATED



Baltimore Division, Baltimore, Md.

Dallas Division, Chicago, Ill.

Michigan Division, Detroit, Mich.

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EXECUTIVE OFFICES: NEW YORK CITY

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# GET THE GOLD

## in your TELEPHONE!



INSTRUCT YOUR SALESMEN  
always to mention the familiar  
Armco triangle and what it  
stands for: twenty-six years of  
rust-resisting, low-cost service.



READ "INGOT IRON SHOP NEWS" every month for ideas and suggestions on how to stimulate sales, cut costs, and turn out better work. Published by the Armco Distributors Association, this valuable business-building paper is free to anyone concerned with sheet metal work. Write us if you want to see it regularly.

YOU PAY A FIXED RATE for your telephone whether you use it or not. But there is a gold mine in it if you use it to sell, intelligently and consistently.

Consider every subscriber a prospect. Each morning select from the directory a certain number of names and call them. Your sales talk which should be rehearsed beforehand, might run something like this:

"Good morning, Mrs. Smith. This is John White talking, the sheet metal contractor. I thought you would be interested in knowing that now is a favorable time to have your sheet metal work inspected and put in good, serviceable condition. My labor-and-material costs are extremely reasonable; and I can repair or replace your gutters, downspouts, flashing and other important construction for much less than it will cost you later on. My men are highly-skilled, and I use nothing but rust-resisting Armco Ingot Iron, the long-lasting, low-cost sheet metal. If you wish, I'll be glad to run out and inspect your sheet metal work. This service costs you nothing. Won't you try it?"

You can save time and money, and *make money*, with the aid of your telephone. Put this useful servant to work making profits for your shop.

### THE AMERICAN ROLLING MILL COMPANY

Executive Offices: Middletown, Ohio

Distributors in the principal cities of  
the United States and Canada

PROFITS COME  
WITH BETTER SELLING  
ARMCO PRODUCTS  
*Help you sell*

## "Rolling With The Punch"

WITHOUT any question, business has reached the stage where it is necessary for all of us to forget precedent and plan our business along fundamental lines of thought and action.

This year has proved to us that the miracle cannot happen. The deeper we think into conditions the plainer it becomes that panaceas cannot stimulate business so that every man who ought to buy—can buy.

If we accept this one fact and forget miracles—political, financial and otherwise—and begin to think and plan in terms of fundamentals we immediately eliminate a lot of the obstacles which are making our business tough today.

We might as well accept now the fact that fundamental thinking and action is going to hurt our pride, butcher our pet schemes and strip us of a whole lot of the scenery we have used to kid ourselves.

We must plan our campaign from here on just as the seasoned fighter executes his ring battle. He knows that a good campaign is not always an advance, but a campaign in which he presses the battle and rides the momentum; that "rolling to the punch" is often the only way to stay on his feet; and that a back step is far better than a knockout—though not so sensational to the audience.

We have said that fundamental planning will hurt our pride. Perhaps it will hurt to give up the downtown show room or the main street office. But if our income is not sufficient to keep that show room or if we know that very few customers ever see the inside of our "place," then it is throwing money out of the window to keep it up. No one willingly becomes a "back alley" dealer, but under present pressure no place of business can be bigger than present income justifies.

Perhaps we have been known as the "biggest operator" in our community. Naturally, we like such praise, but the cold fact is that in times like these the "little fellow" is better established to weather the storm than the "big fellow" who is spread out financially.

We may hate the comment which comes when we let our men go or cut their wages, but it is better for those men to get paid for two or three days' work a week than to be turned out on the street because we have to close up shop.

Every community has its operator who prides himself on being the carload buyer of the town. That man

hates to drop back to the "sell them and order them" class, but again, fundamental thinking will show the foolishness of taking long financial risks just in order to keep a name which in these times means nothing.

Strange as it may seem, it was only three years ago when we heard much of the expression—"I got out of the furnace game (or the sheet metal game, as the case may be) because that game is a racket. I concentrate on sheet metal (or furnaces) and I'm leaving that racket to the little fellow who doesn't know any better."

The facts are that if we are to stay in business we have got to turn our hand to every class of work we are trained or equipped to do. Furnace men will have to do gutter and downspout work. Ventilation experts will have to do furnace and gutter work. Sheet metal specialists will do furnace and roofing work.

A lot of us are going to have to get over the humility of a shabby truck or car and be content to drive a last year's model. But don't forget that the public, just as you or I, is no longer impressed with flashy newness and will probably prefer to deal with a man who looks like he wants work than with the fellow who must make large profits to maintain his "front."

Hundreds of contractors already have reached the place where they willingly take every small repair job which comes their way. If we grew up in the shop we should be willing to take our place at the bench.

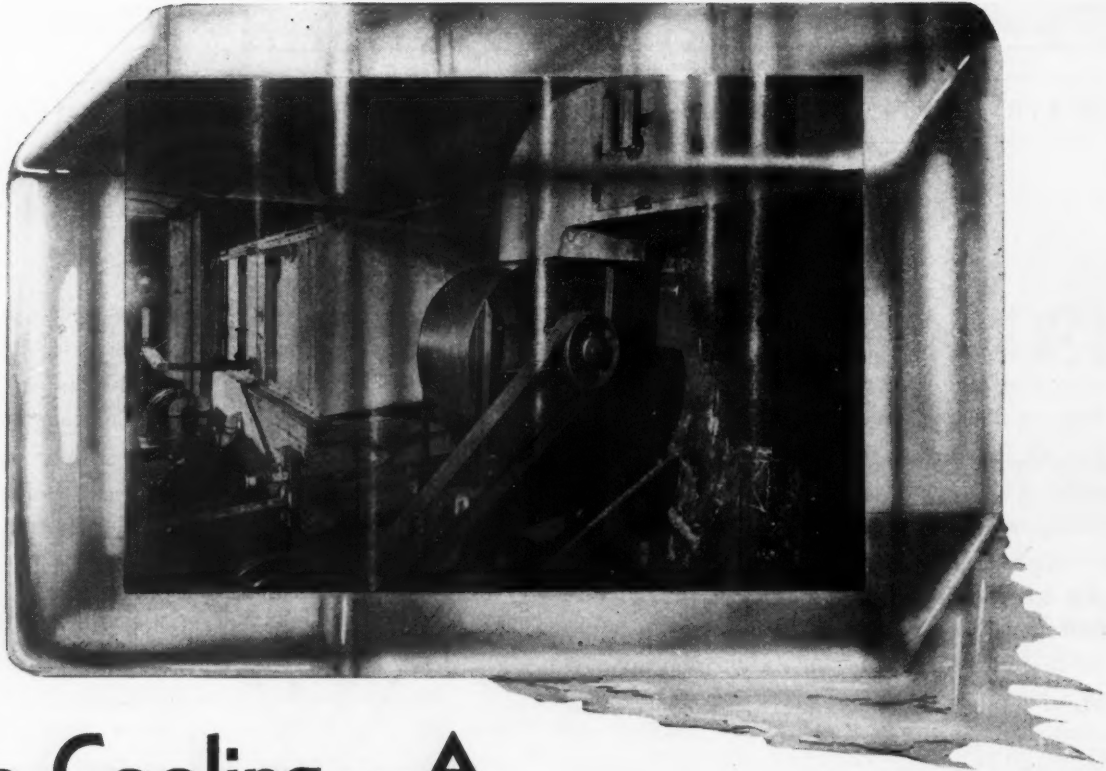
If today's condition does nothing else, perhaps it will teach us the value of a cash business and the savings which come from taking cash discounts instead of wordy praise from the man who sells us a carload to be paid for God knows when.

These remedies are drastic—but these are drastic times. All industry, and not ours alone, is working to or has already reached this return to fundamentals. From now on the battle is going to be one without quarter.

If we will remember that these drastic measures need be only temporary shifts in the campaign and that we can always come back if we don't get knocked out, much of the sting will be taken away.

And most important of all let's take conditions like a fighter. Wailing to prospects won't help a bit. Let's be optimistic in our selling because we know we are entrenched behind a line which nothing can penetrate. Let's dig in for a battle and then fight!





# Ice Cooling—A Practical Method for Small Shops

By Roy M. Quackenbush, B. S., M. E.

THE simplest type of system for cooling an enclosure consists of a system of ducts through which air is delivered to the room after previously having been passed through a water spray chamber. In passing through the spray chamber, the sensible heat\* of the air is used to evaporate moisture from the sprays which moisture then becomes a constituent of the air in the form of vapor. The absorption of heat by the water, during the formation of the vapor, causes the sensible heat temperature of the air to be lowered. Actually no cooling is effected as the total heat\*\* content of the air remains constant throughout this operation. The heat that will not be indicated on a thermometer has assumed the form of latent heat and is contained in the vapor now forming part of the air.

\*Sensible heat is the heat which may be determined by the ordinary dry bulb thermometer.

\*\*Total heat is the sensible heat plus the latent heat of the water vapor.

The human body is constantly giving off a supply of heat, the quantity being almost a constant amount, and subject to only slight variations due to changes in surrounding temperature conditions. This heat is carried away from the body in two ways; by radiation and by the evaporation of moisture from the surface of the skin. Since summer temperatures are very close to the human body temperature, very little cooling is accomplished by radiation and the burden of heat dissipation is dependent upon evaporation of the moisture from the skin.

## Dew Point

Air has a definite point of saturation for every temperature and at this saturation point no additional moisture can be evaporated from the body. Since any cooling system that utilizes the effects of evaporation for cooling effect increases the moisture content of the air, without

decreasing the total heat content, it can be readily understood that if the moisture content is increased to too great an extent, conditions for human occupancy will actually be worse than if normal room air is merely fanned.

It will therefore be apparent that a satisfactory cooling system should not only reduce the temperature of the air in an enclosure, but it should also maintain the moisture content of the air at a point where moisture will be evaporated from the bodies of the occupants at a normal rate. To accomplish this result—assuming that the distributing system is designed properly—chilled water is usually used in a spray chamber. This provides an air conditioning system for summer use that will meet the conditions of temperature control, humidity control and cleanliness.

The common practice, in the past, for cooling the spray water has been to operate a refrigerating machine

in conjunction with a water cooler. But the attention of contractors is called to the fact that the same results may be obtained by melting ice—although it must be admitted, the field is more limited. Ice, nevertheless, plays a definite role in the air conditioning industry.

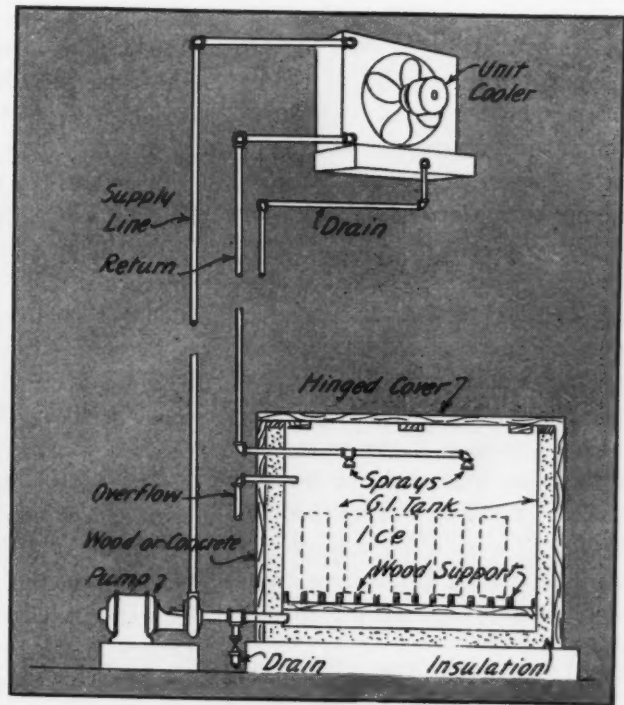
While the cost of manufacturing and handling ice may be, of course, greater than the cost of chilling water by refrigeration, in certain cases the fixed charges, operating expenses and maintenance costs in connection with a refrigerating machine will equal, and even exceed the cost of the ice used in the system.

#### Initial Cost

It is easy to see that the initial cost of an average ice storage space is considerably less than the cost of a refrigerating machine, and in many cases where the installation of a cooling system would be impossible if a machine were the only alternative, an ice melting system may easily be added to the capital investment of the space user. This will hold true particularly for operators of small shops and stores that are located in rented spaces; or in larger shops where only short periods of operation are demanded.

The proper prospects for practical ice melting installations are the owners or tenants of small shops and stores, or users of large spaces having short periods of demand for cooling and in homes. Dress shops,

One method of cooling is to use a combination ice chamber with a pump and unit coolers of this type. Such unit coolers may be installed in the room or placed in the basement and piped to the room by ducts. Note the insulation of the ice chamber



for example, where fitting and trying is necessary, are practical locations for ice cooled systems. Even though the entire shop is not cooled it would be profitable if a simple system be installed in the fitting room.

Small lunch rooms having a large patronage during the lunch period can profitably install an ice cooled system.

Many of the better barber and beauty shops can be sold this type of system because whenever some shops use air conditioning, it may become necessary for all shops to install a system of some sort in order to hold trade.

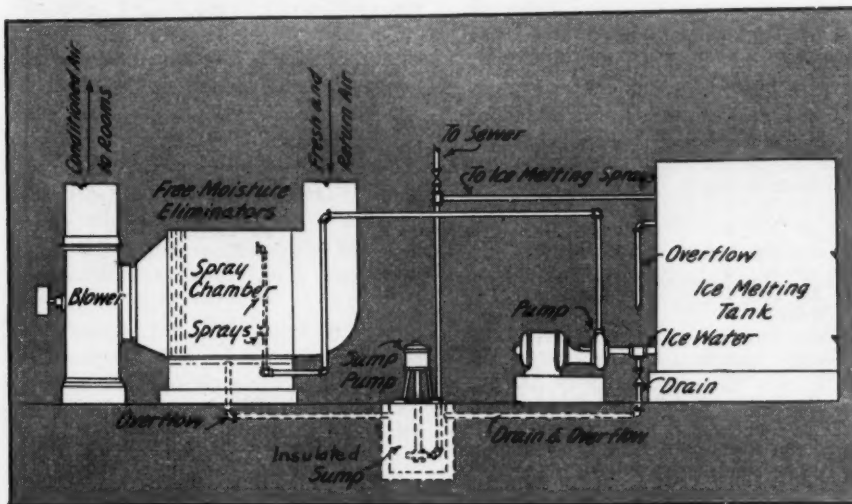
In addition to these potential users, there are several other types of businesses, catering to an exclusive trade, that might find this type of system profitable.

One such fertile field for the development of a demand for the use of ice in air conditioning is churches, lodge halls, chapels or in fact any space where large gatherings are made for short periods between long intervals. Where the gathering is large and the meeting short (of an hour or so), the per capita cost of ice cooling the space will be very small.

#### Unit Coolers

We have mentioned here so far only the use of a spray chamber as a means of utilizing the cooling effects that may be realized from the ice chilled water. However, for small installations another economical system is one in which one of the various types of "unit coolers," now on the market, is utilized. The use of this method meets all the requirements for an air conditioning system providing that a dry air filter is used in conjunction with the unit, to replace the cleaning effect lost by the elimination of the sprays.

It is necessary to sound a warning: In creating the demand for



A more common application of ice cooling is the combination of cooling chamber and a central system of fan and ducts. This diagram shows a system of this type

the use of ice-melting coolers, the contractor may be tempted to recommend the installation of an ice storage tank for use in conjunction with an existing evaporative type of cooling systems now in various buildings. Unfortunately, some of these systems are not installed properly—even for efficient evaporative cooling, and if an attempt is made to transform them into air cooling system now in various ing other changes (in some cases extensive changes), the promotion in this field will receive a decided setback. Some one experienced in this line of work should always survey these present installations, thoroughly, before a recommendation is made.

The writer has made calculations to determine the approximate ice consumption that may be expected in average communities and has made brief surveys of several of the present evaporative cooling systems as they have been installed.

#### Operating Cost

This survey shows that an average, small, inside, ground floor store should require approximately six tons of ice per week in order that the sales space be satisfactorily cooled during the summer months. This figure is based upon the assumption that the air in the store will be conditioned for ten hours a day, six days a week. Reductions in operating hours would result in proportionately reduced ice consumption. Corner stores require approximately ten tons per week on the same basis. A complete cooling system, for the average small store, should cost from \$750 to \$1,000.

Probably the most practical solution for cooling the average home is to cool only one room, say the living room. The average living room can be cooled for only slightly more than the cost of the fuel that is used for heating. In the southwest, for example, in the warmest weather the average weekly ice consumption should not exceed  $1\frac{1}{2}$  tons per

week, but if the owner will give the system some attention and will keep the house closed, during absences, it should be possible to cool the one room, during the summer season, with as small a quantity of ice as 25 tons.

For other parts of the country where the hot season is shorter, cooling should cost less.

A typical system could easily be designed so that the living room could be cooled during the day and the bed rooms could be cooled at night. In this case an ice storage box and a chilled water pump should be located either outside the house or in the basement and the ice water would then be piped to the coolers in the house. Unit coolers can then be installed in the rooms in which the cooling is desired and these units should then be valved so that cooling could be had, wherever desired.

On furnace systems the connection is made directly between the spray chamber and the casing.

A system, designed to cool the average living room, would cost approximately \$500, and if it be arranged to cool two bed rooms at

night, approximately \$250 per room should be added to the cost of the original installation.

Of course, the above information is based on the assumption that the owner will use discretion in the use of his cooling system. To cool a home 24 hours a day without taking advantage of absences and without keeping rooms closed and shaded would involve an operating expense beyond the average income.

The amount of ice that will be required for the larger installations such as churches, etc., will vary considerably, as shown by the list published with this article. (The exact cost of making an installation, whereby the use of ice may be utilized, will vary according to the condition of the present system. To present these costs would require a very careful survey of the site.)

The writer believes that the use of ice in the air conditioning field will in time be common practice, but first the potential user must be made acquainted with the fact that economical cooling with ice is possible. After a few satisfactory systems are installed, the future developments in this field are assured.

#### LIST OF LARGE BUILDINGS THAT WERE SURVEYED

Average Building	Present System	Condition of System	Est. Ice Consumption per Week
IN TOWN OF ABOUT 70,000 POPULATION (Probably typical of the greater portion of South and Southwest)			
CHURCHES			
No. 1	None		4 Tons per Service
No. 2	Evaporative	Good	$4\frac{1}{2}$ Tons per Service
No. 3	Evaporative	Poor	2 Tons per Service
No. 4	Evaporative	Fair	4 Tons per Service
No. 5	Evaporative	No Data	4 Tons per Service

#### MISCELLANEOUS

Mortuary No. 1	Evaporative	Good	3 Tons
Mortuary No. 2	None		2 Tons
Mortuary No. 3	None		2 Tons
Cafe No. 1	Evaporative	Fair	12 Tons
Cafe No. 2	Evaporative	Poor	10 Tons
Cafe No. 3	Evaporative	Good	25 Tons
Cafe No. 4	Evaporative	Fair	10 Tons
Bank	Evaporative	Fair	25 Tons
Apt. Building	Evaporative	Good	12 Tons
Radio Station	None	Not Surveyed	

#### PROSPECTIVE SMALL INSTALLATIONS

Type of Store	Estimated Weekly Ice Consumption
12 Restaurants and Lunch Rooms	5 Tons Average
10 Barber and Beauty Shops	3 Tons Average
7 Drug Stores	10 Tons Average
30 Miscellaneous Shops, etc.	5 Tons Average



# The Coal Stoker Service Plan

**This short article describes a 24-hour service plan for users of domestic stokers. The plan has had extensive trial in some sections of the country and is spreading. Our purpose in publishing this article is to show how rapidly owner-free heating is invading all fuel fields and to ask—"Where does the furnace man stand in this picture?"**

Furnace men generally have been watching with much interest the shifting battle between competitive fuels. One of the most interesting developments of the last two years is the growth of stokers and of more recent advent the stoker service plan.

For the benefit of readers who have heard of this plan, but who have not yet seen the plan in operation the following description, reprinted from *The Black Diamond*, leading retail coal paper, may be of interest.

"Hence, although still doing business under the name of the Horne Coal Company, Mr. Horne five years ago began to change his business from that of retailing coal to that of intelligently merchandising a complete heating service which makes it unnecessary for the consumer to go into his basement from one year's end to another's, insofar as his heating goes.

"At the outset, he was told frequently that he was 'crazy.' Convinced that the consumer would refuse to continue to pay high margins for any fuel, he constructed his business upon the principle of complete, all-round service, and has ever since charged a margin for that service which yields him an entirely satisfactory profit.

"Today in Lowell, Mass.—a city which has seen its share of the effects of the present period of economic disturbance—he has installed more than a hundred automatic stokers, the majority of which he completely services.

"What is Mr. Horne's idea of complete service?

"In the first place, when he installs an

Electric Furnace Man, he guarantees to remove it within the first year, and to return every dollar paid for it by the customer, if for any reason the customer wishes it removed. Once only has that been requested.

"Other customers, to whom the same guarantee has been made, have said: 'Horne made that pledge because he knew that, once we had experienced the satisfaction of the stoker plus his service, we'd never let him take it out.'

"In the second place,' says Mr. Horne, 'if you put in a stoker, whether you take advantage of my complete heating service or not, so long as you buy your fuel from me, the payment for the stoker will be your last cost in connection with it, for I will keep it in constant repair.'

## How the Plan Works

"Here's how it works: a service man not only delivers the fuel needed, but keeps the stoker hopper filled, removes the ashes, keeps the machine in full repair.

"I tell my men,' said Mr. Horne in discussing it with me, 'that if there is any little chore around the basement, like carrying out a barrel of waste papers for the garbage man to pick up, that the customer wants done, he is to do it. If, later in his round, the barrel has been emptied, he is to set it back in the basement again. Our service on the stoker is twenty-four hour service—we can be called day or night, if heat isn't being had as wanted; we prefer to be called than to have the customer attempt to make adjustments.

"As for the guarantee on the stoker where we do not service the heating, we still guarantee the equipment against defects or damage from abuse."

"In this matter of service,' said Mr.

Horne, 'I try to put myself in the place of my customer, and to see to it that we leave nothing undone that he might wish to have done.'

"Is there any wonder that, with experiences of this kind behind him, Mr. Horne is confident of his correctness when he says: 'I have yet to find a man who is unwilling to pay you a satisfactory profit provided you give him the kind of service he wants?' (Please note, he stresses service; does not mention size of fuel, or kind.)

"Too many coal men,' he said, 'haven't yet climbed down from that old wagon that used to be the symbol of the coal business; they are content to watch their business drift away from them, blaming the weather and what will you, instead of putting the blame where it belongs—upon their unwillingness to keep up with the changing habits and desires of their customers. Is it any wonder they are losing business—all around them they see—or can see—the habits and desires of the human race change as advancement crowds advancement for room; yet they are still trying to conduct business as their grandads did.'

## Buying Plans

"The installations have been made for cash; Mr. Horne in his pioneering financed his entire business, and consequently would not jeopardize it by taking undue credit risks. Now, however, the business is on its legs, each stoker installation paving the way for other installations—several of those originally installed account for second and even third sales.

"Today, therefore, Mr. Horne is planning to offer stokers on a partial payment basis, which will widen his field of activities, and make the present assured annual tonnage of more than 2,000 tons grow to many times that quantity. The sale of a stoker, with the resistance of cash payment removed, simplifies itself, and carries with it the sale of fuel to feed the stoker for years to come.

"Show me a young chap,' he said, 'with a little engineering knowledge, and \$5,000, and I will set him up in business—in the most forward looking business I know today. In New England there is always going to be need for heat; and the fellow who will go into a town, offer a complete heating service, and keep that service complete and satisfactory, is bound to make money. When he sells a stoker on a guarantee of complete service, he has sold a quantity of anthracite for years to come; one stoker will sell another, and the first thing he knows, he'll need to do no more selling—the sales which satisfied customers bring him will keep his stoker department busy; and the stokers themselves will keep his coal business busy.'"



## A Ventilating System For A Wisconsin Resort Hotel

**A**PPROXIMATELY 12,000 pounds of galvanized iron was used in connection with the ventilating system installed in the new \$250,000 Oakton hotel on Pewaukee lake, approximately 20 miles west of Milwaukee. The hotel promises to become one of the middle west's outstanding all-year recreation centers, where every branch of sports will be offered, both summer and winter, with complete hotel service in addition.

The three-story structure, the lower part of which is constructed of stone, is equipped with a large indoor swimming pool containing 60,000 gallons of pure spring water. Approximately 2,500 pounds of 16-ounce copper was used in the gutters and ornamental work on the building.

A supply fan with a capacity of 10,000 cubic feet per minute is located in the basement. In addition there are two exhaust fans, one with a capacity of 5,610 cubic feet per minute and the other with a capacity of 3,600 cubic feet per minute, both of which are located in the attic. The former fan is for the toilets, lockers, and bathrooms, while the latter is for the kitchen. The supply fan furnishes the tank

room, dining rooms, lobby and various lounges.

Also in the attic is a 40-inch roof ventilator for fresh air intake, a 36-inch roof ventilator for exhaust fan outlet equipped with back draft damper and a 30-inch roof ventilator for exhaust fan outlet, similarly equipped. Two three-quarter H.P. motors with rope drives are also located in the attic.

On the second floor are nineteen bedrooms, each of which is equipped with bath, one lounge, a sun room and sun roof. The bath room vent dampers have been set for 50 cubic feet of air per minute. In the lounge there is also an 18 by 64-inch supply air flue, an 18 by 40-inch return flue and an 18 by 36-inch exhaust flue. Bathrooms in each of the rooms are equipped with ventilating risers measuring 8 by 6 inches. The bedrooms measure approximately 10½ by 16 feet and each has an outside window.

The main floor has the main dining room, six private dining rooms, ladies lounge, lobby, check room, office, grill room and kitchen. The kitchen is supplied with a 48 by 24-inch fresh air flue, a 64 by 18-inch fresh air flue, and is exhausted with a 40 by 18-inch vent flue, 36

by 18-inch vent opening in kitchen ceiling, 3,600 cubic feet per minute and two offset flues at first floor ceiling. In addition there are four ventilating grilles, 8 by 6 inches, set at 50 cubic feet of air per minute.

Two heat grilles with 1,800 cubic feet of air per minute, measuring 48 by 18 inches, supply the dining room, which measures 57 by 39 feet. A 24 by 36-inch vent grille is located on both sides of the wall between the kitchen and the dining room, with louvres between.

Ventilating ducts in the basement are of various sizes, ranging from 40 by 20 inches to 10 by 6 inches. A one and one-half horsepower motor with a rope drive is also located in the basement. Copper and ventilation work was done by the Louis Hoffman Co., Milwaukee, and this portion of the job was carried on right along with the general construction work. Ventilating fans were installed by George A. Portz of Milwaukee.

The entire basement area containing the tank room is exhausted indirectly through grilles in the base of the doors. The direct ventilation occurs in the toilets, locker rooms, showers, and steam bath rooms. These rooms have exhaust

grilles near the ceiling line, and the rapid displacement of air in this area creates a low pressure condition that draws the air through the door vent grilles from the adjacent rooms.

In the tank room and foyer, grilles in the side wall at the floor line open into vent risers that discharge the air into the locker rooms at the ceiling line.

The exhaust duct velocities vary from 1,200 feet per minute in the riser to the attic exhaust fan to 500 feet per minute in the branches and 250 to 300 feet per minute through the exhaust grilles.

The supply mains from the sup-

ply blower have velocities that vary from 1,200 near the fan to 500 feet per minute in the branches and 300 feet per minute at the supply inlets.

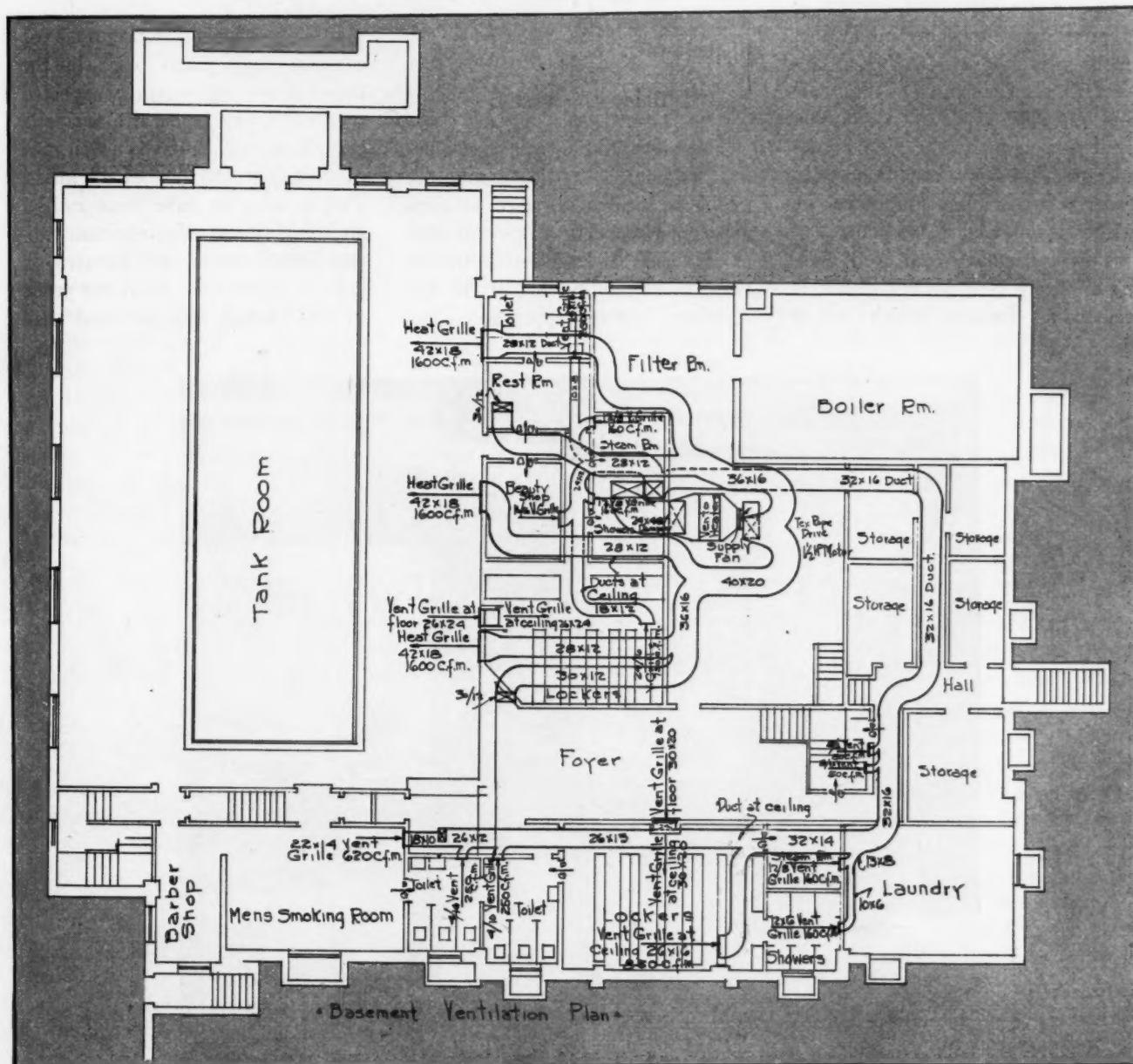
The vents and heaters together with the supply fan are located near the boiler room. The hook-up is a "draw through" type. In other words, the air is drawn through the heaters and handled by the fan after being heated. The type of hook-up requires a somewhat larger fan due to the expansion of the air or the decrease in density. As the entire building is heated by direct radiation and air is supplied for ventilation purposes only, the air is heated to but little more than room tem-

perature, or about 75 degrees at the supply inlets.

A thermostatic valve on the steam supply main to the vento coils, maintains a constant temperature. In mild weather it is possible to heat the entire area supplied by the fan with the coils by raising the inlet temperature slightly.

The direct boiler load demanded by the vento heaters depends, of course, on the temperature rise required, the load being heavier in cold weather.

A steam jet humidifier placed on the "hot" side of the heaters supplies humidity and is controlled by a humidistat located in the lounge.



The basement plan shows the arrangement of the piping system from fans to inlets or risers. There are two exhaust systems with fans in the attic. The supply and exhaust systems are foolproof in their simplicity.



# Conditioned Air— NO LONGER A LUXURY!

**D**ID you ever stop to consider how the public's conception of heating comfort has changed in the last two years?

If you have not, a few moments devoted to an analysis of your prospects and their desires may change your whole plan of operation.

If you have considered these changes, then you undoubtedly can find points of common interest in the experience of the local Minneapolis sales office of the Waterman-Waterbury Company in the sale and installation of a conditioning system to a professor who knows enough about air conditioning to order exactly the conditions he wishes maintained in his home.

This particular installation illustrates nicely how today's public is demanding features which just a

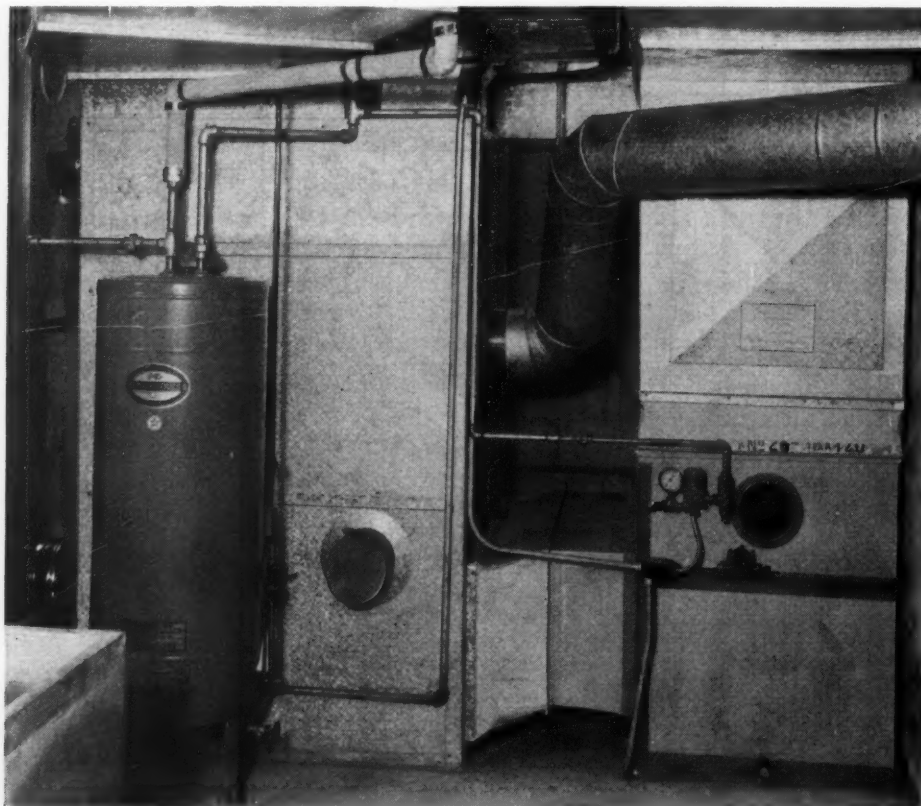
few years ago were considered luxuries and frequently not considered within the expenditure possibilities of the average home owner. Not so many years ago the public bought heating plants to furnish one thing—heat—for, so far as the public knew, heat was the only thing available. Air circulation, humidity, cleaning, absolute control were wonderful things to think about, but outside the price range of the owner.

## Today's Necessities

Today even these features are being accepted as ordinary and the public is looking forward to even more phenomenal developments such as summer cooling and complete year round conditioning of the air. Another feature—appearance—has

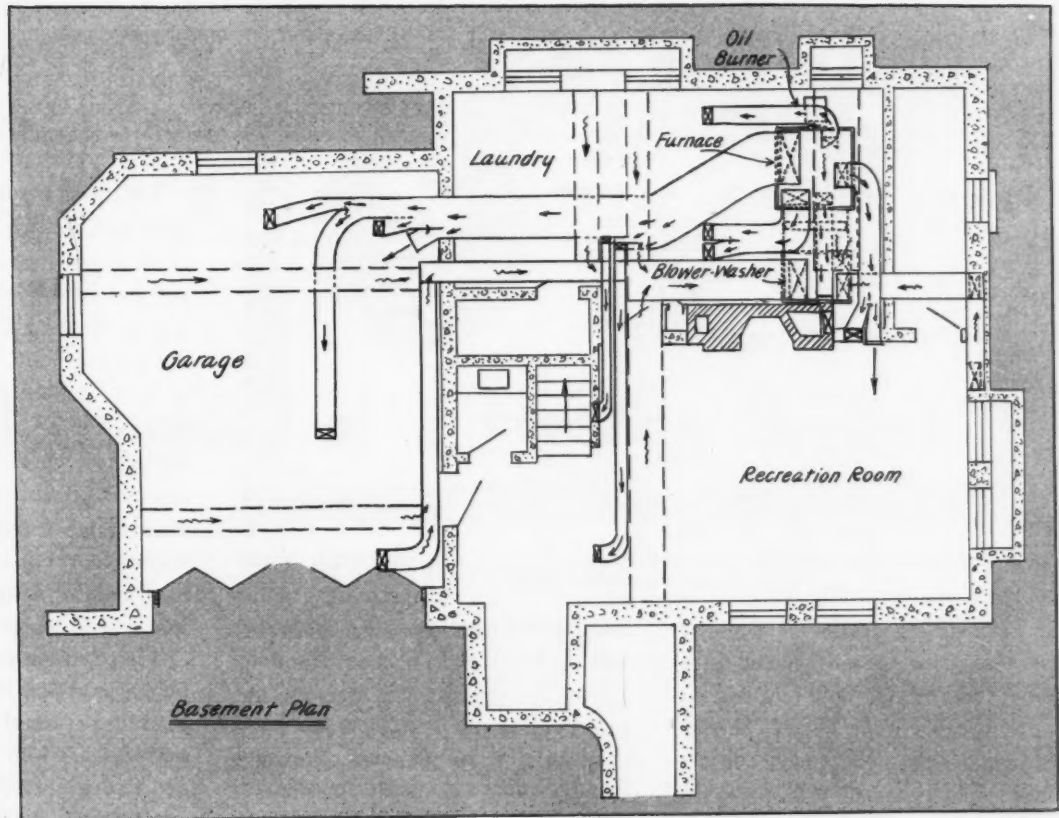
played an important role in the change from just heat to air conditioning. Just a few years ago the public accepted radiators as necessary evils, or, in furnace systems, large, conspicuous registers and grilles. Today appearance demands radiators concealed in the wall and in furnace systems registers which can hardly be seen without close inspection.

Equally changed conceptions of comfort have taken place in the things a heating system is expected to do. Every housewife wants a clean home and demands air cleaned of dust, lint and dirt of all kinds. People seem to have gone radical on humidity and this important subject has replaced oil burners in popular discussion. No better proof of this change need be cited than



The conditioning unit consists of a square cased furnace, blower, washer, oil burner and complete controls. All duct work is rectangular

The piping plan shows the unit placed in one corner with one large duct and four small leaders. Duct sizes are such that velocities up to 700 f. p. m. are maintained in the mains and 300 f. p. m. at the register



the dozens of patented humidifying devices which have been introduced to the public.

Dealers have also found that this popular discussion of air conditioning has created a condition which can be capitalized by the simple process of making every job so satisfactory that the owner feels the urge to talk about it. Aggressive dealers have even gone a step further and carefully chosen their

first prospects with the definite idea of making these buyers advertise the contractor's work and design.

Exactly this situation occurred in the installation discussed here. Dr. J. W. Buchta is a Professor of Physics at the University of Minnesota. His home is located in a new residential district between St. Paul and Minneapolis, where Professors and Instructors of the University

have built and will build many beautiful homes under the plan of Financing and Building sponsored by the University.

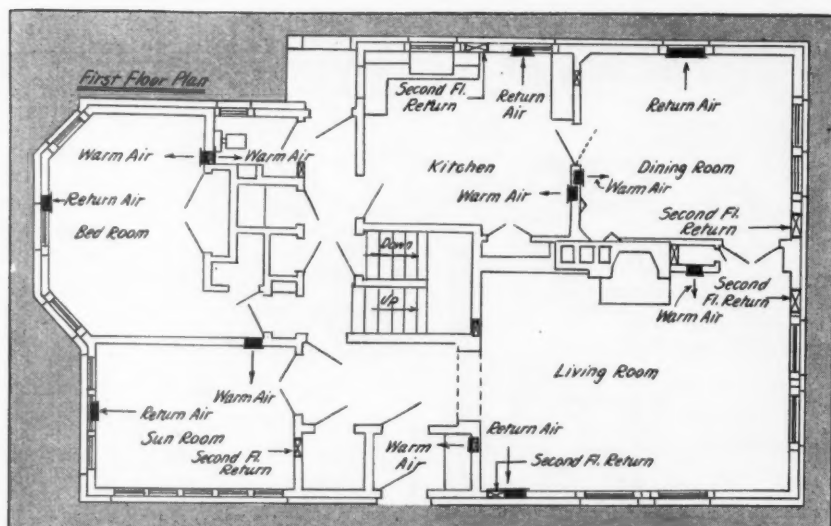
Doubtless this program will be continued for years to come and there will be an ever increasing number of new neighbors in this beautiful, up-to-date district.

Surely, this is an enviable opportunity for any dealer who wins the friendship and enthusiastic support of each new customer in this district.

The house is a fine example of present-day architecture. A basement garage and amusement room are heated by the system. The oil burner, furnace, and washer-blower installation is sufficiently clean and neat-appearing so that the opposite end of the furnace room can be used for a laundry, there being ample space for this purpose. The sun room, on the first floor, with eight large windows, does considerable to make the race between the furnace and an inspired west wind an honest-to-goodness contest. The second floor comes in for its share of attention with three bed rooms, bath and study losing heat through large areas of exposed ceil-



The house is modern in architecture, masonry walls, steel sash, large glass areas, with the garage in the basement. A. R. VanDyck, Minneapolis, is the architect



Supply and return are provided for every room. Returns are on outside walls with inlets on inside walls

ing in addition to the sources of heat loss encountered on the first floor. There's no doubt about it; this arrangement of heater, blower and metal ducts has a job on its hands. But because of good design the system has covered itself with glory by ably and consistently taking care of the "weather" requirements of all the rooms at any time. It has truly scored a victory, and without the necessity of running exposed piping to detract from the appearance of the job or to occupy otherwise valuable space.

The basement plan shows the complete arrangement. The burner is a Silent Electric. The furnace is a 27-inch Waterbury Seamless with an Ampeco blower-washer. The burner is controlled by a room thermostat with a limit control in the furnace bonnet. The fan and washer start and stop automatically by the action of a furnacestat. It is contemplated to later add a humidistat to serve as a limit control for the washer, which is equipped with a solenoid valve in the water supply line.

The joists are 2 by 10-inch under the main part of the house and run north and south. Over the garage

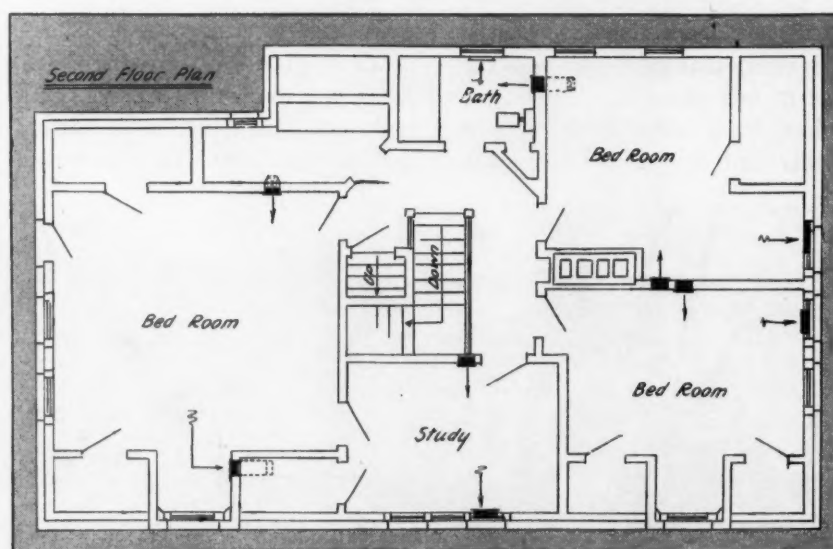
are 2 by 14-inch joists running east and west. Cold air leads running across the garage are between the joists. Warm air and cold air leads running north and south over the laundry and recreation room are entirely between joists. This leaves the ceiling of the recreation room entirely free of piping, and no other piping over the entire basement deeper than 8 inches. The basement depth is only 7 feet 6 inches, but there is no cause for any "duck-

ing" to avoid pipes. All metal work, including register boxes, is of galvanized iron.

### Registers and Grilles

The floor plans show a warm air inlet and a return air outlet to and from every room. Cold air faces are baseboard, wall-type faces, being set flush with the baseboard on the second floor. Warm air outlets in all rooms except first floor toilet and vestibule are also baseboard, wall-type registers. In these two rooms registers are flush with the wall, and 5 feet 6 inches above the floor. All registers were finished on the job to match the scheme of interior decoration.

The total heater load, cared for by the furnace, is 138,741 B.t.u. per hour. The total air movement required, based on a temperature rise of 70 degrees, is 1746 c.f.m. The duct system is designed strictly according to the method of "compensation for loss of head due to friction," with velocities ranging from 300 to 700 feet per minute. No register velocity runs above 300 feet per minute.



Rooms on the second floor also have direct return to the blower with registers and grilles located similarly to the first floor

"Tailor Made" is a term closely associated with rectangular duct installations. How to handle the fabrication and erection problems and get a job which goes in smoothly is something all of us are interested in. In the August issue we will publish an article explaining one contractor's method of getting such an installation.



# FAN BLAST ENGINEERING

by P L A T T E  
ENGINEERING



O V E R T O N  
EDITOR

## "Mechanics" of a Heating System

**R**EADERS who are interested in the "mechanics" of a heating system and are anxious to enlarge their scope of information on furnaces will be interested in the six questions which were recently submitted by L. K. Hughes of the Howard Furnace Company, Toronto, Canada. These questions are beguilingly simple, so much so, in fact, that they hide problems as old and as complicated as the furnace industry itself. Because these questions go so deeply into warm air heating we are publishing an article on them.

Here is Mr. Hughes' list of questions—and his letter:

Dear Mr. Overton:

"Would you be kind enough to give us your opinion on the following:

1. What determines the heating efficiency of a warm air furnace?
2. What relation has radiating surface to grate area, square feet?
3. How much extra heating capacity does extra radiation surface give you?
4. Does not a furnace with a fire pot that is absolutely straight, say 22" at the top and 22" at the bottom, give more heat than a furnace with a fire pot, say 23" at the top and 20" at the bottom, providing the radiating surface was practically the same?
5. What surfaces are radiating surfaces?
6. How can you determine the heating efficiency of a furnace from its measurements?

"I am constantly reading your articles regarding Fan Blast Heating in the American Artisan and might say that you certainly deserve credit for endeavoring to teach the sheet metal worker something about a real new heat-

ing field that is steadily opening up.

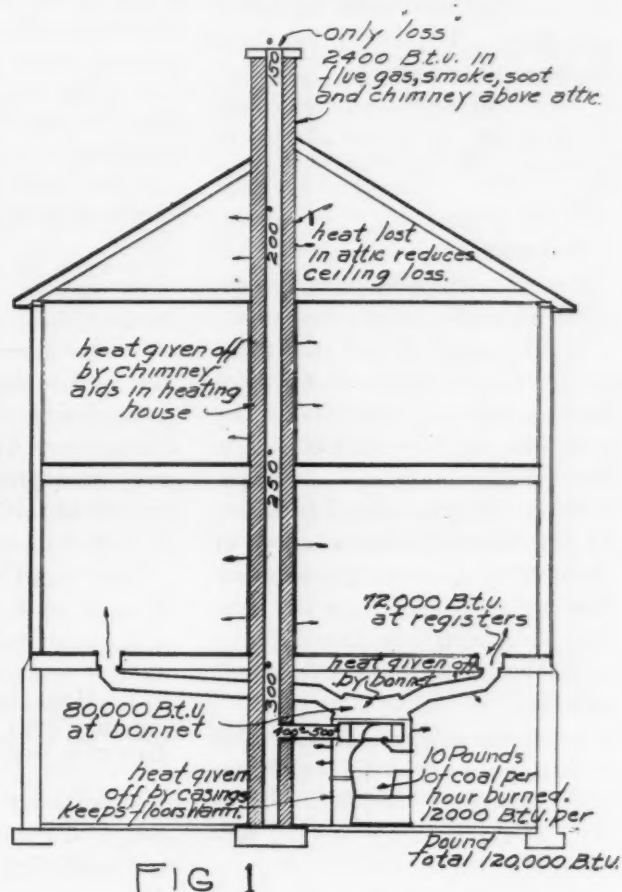
"I have a Fan Furnace and Water Washer System, automatically controlled, in my own house and have not opened a window in my house all winter, when I tell people that they look at me to see what they can find wrong. But there is no two ways about it, the idea of opening a window and letting in ice cold air to a bedroom and climbing in under 15 to 20 pounds of blankets, is like sticking your head in a refrigerator and going to sleep."

Mr. Hughes' six questions are a good basis for a text book. One

can hardly cover them in a 3 or 4 page article, but as they are of prime importance we will attempt to cover them by direct answers and a few paragraphs covering the important details.

It is well to point out at this time that we must not confuse "efficiency" and "capacity." Furnaces are very flexible. I know of no better proof for this statement than to point out that most furnace installations heat the house in which they are installed, and my veracity could be questioned if I were to state that more than 50% of them were correctly installed.

There is considerable argument as to just what heat generated in a furnace is "lost." Actually, very little heat is lost as shown in this drawing. If the chimney is an outside one, some heat will be "lost," of course. The drawing indicates where heat generated is given off



Over 65% efficiency was obtained at Urbana at a 4 pound combustion rate per sq. ft. of grate per hour, but given the proper draft one could burn 12 pounds per hr. per sq. ft. of grate and increase the capacity of the heater over 100%, but the efficiency will drop to 45%, or a 30% decrease.

Remember that Mr. Hughes speaks of "capacity" and "efficiency."

### 1. What determines the heating efficiency of a warm air furnace?

The efficiency of a warm air furnace is the ratio between the fuel in B. t. u.'s as fired and the B. t. u.'s available for heating. We have 3 types of efficiencies—overall, register, bonnet.

The overall efficiency is obtained at the chimney top. Such B. t. u. as are not lost in flue gas temperature, combustible material such as gas, smoke, and soot must necessarily be lost in the building, hence are not really lost.

Register efficiency is obtained at the warm air inlet and is affected or reduced by the loss through the furnace casings and warm air ducts and risers. The longer the ducts the lower the efficiency.

Bonnet efficiency is the efficiency at the casing top and is affected or reduced by the loss through the casings.

#### Example:

Fig. 1 indicates furnace, casings, warm air leader, smoke flue, etc.

If 10 pounds of coal are burned in the fire pot in one hour, each pound containing 12,000 B. t. u. we have  $10 \times 12,000 = 120,000$  B. t. u. in the fuel.

If our flue gas analysis at the top of the chimney indicates a loss of 2,400 B. t. u. in the gas temperature, volume, smoke, soot and combustible material, we have  $2,400 \div 120,000 = .02$  loss or 80% overall efficiency.

If we are able to produce 72,000 B. t. u. per hour at the register we have  $72,000 \div 120,000 = .60$  or 60% of the B. t. u.'s = 60% efficiency.

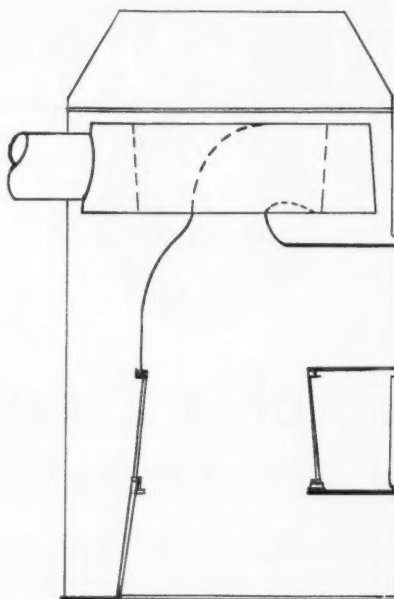


FIG 3

There have been furnaces made with inverted fire pots. The construction looked like this.

If we are able to produce 80,000 B. t. u. at the bonnet we have  $80,000 \div 120,000 = .666 + \%$  efficiency.

### 2. What relation has radiating surface to grate area square feet?

Much depends on the design of

The formula for furnace rating given in the Standard Code is

$$L = 1.75 G [1 + 0.02 (R-20)]$$

Where: L = square inches of warm air pipe connected to the furnace as calculated

G = Grate area in square inches; the area of the fire pot at the grate level; its most restricted area.

1.75 = A constant based upon the results obtained in the Association Research on a furnace having 20 square feet of heating surface for each square foot of grate, and including factors for:

E = efficiency of heater;

C = combustion rate;

F = calorific value of fuel;

0.75 = percentage of fuel available at register;

136 = B. t. u. delivering value of one square inch of pipe, assuming half of the heat is sent to each floor. The value is based on an operating temperature of 175° F. at the register.

The formula allows 1.75 square inches of warm air pipe area for

TABLE I

	No. 1 Positive Correction	No. 2 No Correction	No. 3 Negative Correction
Grate area, sq. in..... =	346	346	346
Heating surface sq. in..... =	7540	6920	5665
Ratio heating surface area to grate suv =	21.8 to 1	20 to 1	16.4 to 1
R-20 .....	1.8	0.0	-3.6
Correction per cent..... =	3.6	00	-7.2
1.75 G..... =	606	606	606
L = 1.75 G + correction..... =	628	606	562

the furnace but for a furnace of good design, 20 feet of radiating surface per square foot of grate may be expressed as a minimum, and 40 feet of radiation per square foot of grate as a maximum. Hence a good heater may have a ratio of 28 to 35 sq. ft. of radiating surface to 1 foot of grate surface.

### 3. How much extra heating capacity does extra radiation surface give you?

Here also much depends on the design of the heater and where the extra radiating surface is.

each square inch of grate area for the furnace having a ratio of heating surface to grate surface of 20 to 1. For furnaces having other ratios of heating surfaces to grate surface, it adds 2 per cent or deducts 2 per cent for each unit above or below a ratio of 20. [Table I]

For large heaters with ratios of from 25 to 40 feet of heating surface to 1 square foot of grate surface it is necessary to make tests. Such heaters are for mechanical systems only and have high com-

bustion rates; 12 to 14 pounds of coal per square foot of grate.

4. Does not a furnace with a fire pot that is absolutely straight, say 22 inches at the top and 22 inches at the bottom, give more heat than one with a fire pot, say 23 inches at the top and 20 inches at the bottom, providing the radiating surfaces are the same?

Here the grate diameter of 22 inches wins. The writer has never seen an absolutely straight fire pot and doubts if one could be made (my knowledge of foundry practice is limited). However, if one could be cast, the 22-inch grate is preferred over the 20-inch with the flaring sides. It is assumed that we are discussing cast furnaces as all steel furnaces have straight fire pots. A few years ago some manufacturers made an inverted fire pot (Fig. 3). I do not know if they are still on the market and know nothing of the result obtained, but believe that if any phenomenal success had been obtained we would have heard from them.

#### 5. What surfaces are radiating surfaces?

Any surface that radiates heat is a radiating surface. Such surfaces need not be part of the actual furnace. Radiation may be defined as the transmission of heat in a straight line through space. No one knows exactly what it is, but some of the physical properties are understood. If the radiant heat from the radiating surfaces of the furnace has in turn some good radiating surface to strike on, this surface in turn becomes a good heating surface, as actual as if it were

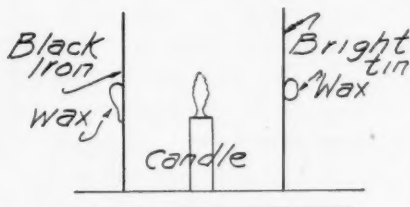
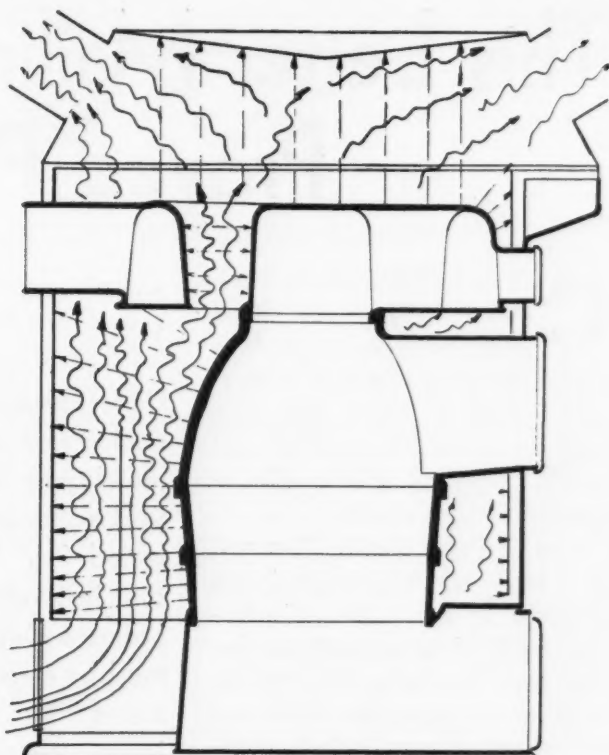


FIG 4

This shows a simple way to test radiation and reflection. Try it on a customer

These "trained arrows" show what goes on when a furnace is "in heat." How efficient or how generous a capacity a furnace may have depends on how the construction handles radiation, reflection and convection



— — — — — Radiant heat  
— — — — — Air not heated  
~~~~~ Heated air

FIG 5

attached to the heater and had the hot gases of combustion on the inner side.

It is interesting to note that bright surfaces that reflect heat are poor heating surfaces, while dull surfaces are good heating surfaces over which to pass the air to be heated. Black iron is a better indirect heating surface than bright tin. We can make this simple test in our own shop and such a test is shown in Fig. 4. The wax behind the black iron will melt before the wax behind the bright tin.

Fig. 5 is an attempt to portray what happens inside the casing of a furnace with a good black iron liner. Note the radiant heat passes through the air without heating it, but this radiant heat heats the black iron liner which in turn heats the air passing over it by convection. Air is a poor conductor of heat and where air passages are large the unheated air may pass to the casing top without any perceptible rise in temperature. The more surfaces direct, or indirect, that air comes in contact with, the better. Tests have

shown that a good black iron liner in a furnace casing added 7% to the efficiency of the heater.

#### 6. How can you determine the heating efficiency of a furnace from its measurements?

The answer is short, but to the point, "You can't." Any attempt to determine the heating efficiency of a furnace by its measurements is akin to determining how fast a man can run by taking his chest measurements.

We may readily determine the capacity within 5%, but the efficiency is a horse of another color. Such may be determined only from a test. Then there are laboratory tests and actual or field tests. A laboratory test may show 68% bonnet efficiency but out in the field, this same furnace, connected to a poor flue and fired by a busy housewife might show an efficiency nearer 30%. Laboratory tests look good in the catalog and are another evidence of the designer's ability but—

(Continued on page 27)



# This Letter Mailing Campaign Proved Profitable This Year

**C**ONTRACTOR reports of results from direct mail efforts using literature supplied by the manufacturers are usually interesting because every contractor wants to take advantage of material which "pulls" and which can be secured at little or no cost.

The Excelsior Cornice Company, St. Louis, has been using letters prepared by the Armco Distributors Association. During the time they have been using this material three sets of letters have been sent out. One set went to house owners, a second to farmers and the third set to industrial plants. Each set consists of four letters designed to carry out a continuity of thought.

In using these letters the company placed the letters in the mail

Under present conditions many contractors are finding sheet metal jobs the only type of work which can be sold and collected for. In order to get a sufficient volume of these small orders a widespread solicitation must be employed. Direct mail meets this problem economically. We shall be glad to hear about similar efforts you have made.

fifteen days apart, thus keeping the firm name before the prospect for a period of two months.

The four letters shown here are the series to industrial plants. The results from the three series differ widely, indicating that some markets are better right now than others and that the wise contractor will take notice of this condition and concentrate his efforts in the field showing the best results.

Since the beginning of this year the firm has mailed 50 sets of letters (200 total) to manufacturing plants in the south section of St. Louis. The returns from these fifty sets show splendid results. From one bridge company \$1,000 worth of work has come in. From a chemical plant \$200 worth of work has

**EXCELSIOR CORNICE WORKS**

"ESTABLISHED IN 1906"

Phones: Riverside 0099 - Res. Riverside 2274-M  
7821 Ivory Avenue  
St. Louis, Missouri



What did you think of our free inspection offer a short time ago?

Though you take care that the equipment of your plant is always in good condition; perhaps, like many others, you give little thought to the sheet metal work.

Fortunately these parts can be repaired very reasonably if the work is done soon enough.

That you may be relieved of this detail and still protect these vital parts of your property against too early failure, we are offering a free inspection service. Our experienced sheet metal man will make a careful inspection of your property and report the condition to you, making such recommendations for repairs as are necessary to your best interests.

Be sure there is no obligation to you for this inspection service. But should you decide to favor us with your new or repair sheet metal work, we can promise you a first class job with the most durable and economical galvanized sheet metal made. It is the well known rust-resisting Armco INGOT IRON.

A phone call, or a letter to the above, will bring your man promptly.


Sincerely yours

**EXCELSIOR CORNICE WORKS**

**EXCELSIOR CORNICE WORKS**

"ESTABLISHED IN 1906"

Phones: Riverside 0099 - Res. Riverside 2274-M  
7821 Ivory Avenue  
St. Louis, Missouri



If windows get broken in your factory office building, you have them replaced at once. If hinges come off the doors, you have them repaired.

But there are some parts which aren't so easy to see and for that reason they are apt to become neglected. The sheet metal work — rain pipes, eaves troughs, gutters, roofs, ventilators, etc. — are too often overlooked until big repair or replacement expense becomes necessary.

I have noticed this so frequently on large plants that I have decided to organize a PERPETUAL SHEET METAL INSPECTION Service for manufacturers.

Without cost or obligation to you, I will have an experienced man go over your entire plant, inspecting all the sheet metal work, and then submit recommendations to you for parts that seem to need repair or replacement. You can then decide as to just what you want done, and I will guarantee you a first class job in every respect.

It may interest you to know that I use and recommend Armco INGOT IRON — famous for its rust-resistance and low yearly service cost. This is the iron you've so often read about in national magazines.

Remember, it will not oblige you at all to get our recommendations on what may be needed. Just write or phone and I will send a man promptly.

Sincerely yours

**EXCELSIOR CORNICE WORKS**

Above are two of the letters soliciting sheet metal work from industries. These letters were prepared for the contractor. The results obtained made the campaign successful from a cost standpoint. Note how inspection for early repairs is emphasized

## EXCELSIOR CORNICE WORKS



"ESTABLISHED IN 1906"  
 \* Phones: Riverside 0089 - Res. Riverside 2274-M  
 7821 Ivory Avenue  
 St. Louis, Missouri

Every so often there is need for some sheet metal work in your plant. Naturally you want to turn the repair jobs over to a dependable sheet metal contractor who will complete the work in short order, using the best of materials.

For many years we have been solving problems in industrial sheet metal equipment. This practical experience is offered you without additional charge.

Moreover, we recommend and use rust-resisting Armo INGOT IRON. This way your roofs are certain to last long and save you many dollars at a trivial cost over ordinary irons and steels.

We shall be glad to look over your sheet metal equipment, and submit an estimate for your approval, without any obligation to you.

You'll find us at 7821 Ivory Avenue, St. Louis, Missouri, or just give us a ring Riverside 0089.

Sincerely yours

EXCELSIOR CORNICE WORKS

## EXCELSIOR CORNICE WORKS



"ESTABLISHED IN 1906"  
 Phones: Riverside 0089 - Res. Riverside 2274-M  
 7821 Ivory Avenue  
 St. Louis, Missouri

When you stop to think of it, dependable plant equipment has much to do with the condition of the profit sheet at the end of the year.

There is sheet metal equipment, for instance. When you use Armo INGOT IRON for roofing, siding, and the dollars saved are turned into profits.

Armo INGOT IRON has the longest record of actual service of any low-cost, rust-resisting sheet metal. For twenty-three years it has endured under a variety of corrosive conditions.

Let us estimate your work. You will be surprised at the low cost of quality work with quality iron. Just write us a letter, or call (Riverside 0089).

Sincerely yours

EXCELSIOR CORNICE WORKS

Here are the other two letters of the campaign. These are shorter than the two shown on the preceding page and are not quite so definite in their solicitation. The letters were mailed fifteen days apart.

been secured. A box factory had \$75 worth of work done.

Equally interesting is the fact that the Excelsior company has secured all the work let by these companies since the first contact was made.

Quite different are the results from the mailing to farmers and house owners. Out of 1,000 letters mailed to these two classifications 30 inquiries were received and 12

jobs were secured for a total of \$300.

In making up the mailing lists for these letters the company took names from building reports—a small number, of course. The second source is personal contacts by salesmen, officials, and friends. The third and largest source is the company's list of customers and prospects. These names, especially if

they were quite old, were carefully checked against telephone books or directories to get the proper initials, spelling and addresses.

The company feels that this direct mail effort has been profitable, but that results show some fields of effort must be carefully considered in order to avoid expenditures which cannot bring returns because of general business conditions.

## Mechanics of Heating Systems

(Continued from page 25)

We are going to add another question.

**7. How important is draft control to efficiencies, and a good installation?**

This question may not be important to Mr. Hughes up in Canada where chimneys are well built and the degree day map shows 8,000, but hear that appalling groan from contractors in Ohio, Indiana, Southern Illinois, Iowa and Missouri.

Why worry about the efficiency

of a furnace and then connect it to a 7x7-inch tile lined flue, 15 feet high, on the outside wall of the house, this flue erected by a mason who learned his trade in a correspondence school.

A good draft and draft control are necessary to any successful installation. The most efficient furnace will be a flop with poor draft, and a shoddy heater may give fair results with good draft and adequate draft control.

Installing a fan or blower in connection with a furnace does not add to its efficiency. We may raise the combustion rate hence raise the capacity and wipe the heat off the heating surfaces at a faster rate but if the official spokesmen are to be believed we do not increase the efficiency. The writer who has considerable experience in testing work has no reason to believe that mechanical means of forcing air over a heating unit adds to efficiency.

# BASIC PRINCIPLES OF HEATING

By G. A. Voorhees

## HEAT LOSS IN UNHEATED ROOMS

**S**UPPOSE we are called upon to lay out a heating system for a farm house (Figure 15) having, as many of them do, an unheated room used only for storage. What effect will that cold room have on the heat losses of adjoining rooms?

To illustrate, let the following conditions be assumed:

Room temperature: 70 degrees.

Outside temperature: 10 degrees below zero.

Outside walls: Siding, wood sheathing, studding, lath and plaster.

Inside partitions: Wood lath and plaster on both sides of 2"x4" studding.

Doors: 21 square feet each.

Windows: 15 square feet each.

Ceiling height: 9 feet.

Ceilings: Warm—meaning that there are heated second floor rooms above all first floor rooms so that no heat loss through ceilings need be figured.

Floors: Warm—meaning that there is a basement under the entire house and that there is no furnace room partitioned off from the rest of the cellar. Thus basement air warmed by the smoke pipe, furnace and warm air leaders, can spread out freely along the basement ceiling and thus prevent downward transmission loss of heat through the floors of the rooms above.

### Determining Temperature

Before we can determine how much heat must be supplied to the kitchen and bedroom to offset the transmission losses from those rooms to the adjoining cold room, we must first find some reasonable basis for arriving at the temperature of air in the cold room.

Two things are at once obvious: First, that the air in the storage room will be warmer than the outside air because it receives some heat by transmission from the ad-

joining heated spaces and second, that it will be colder than the air in the kitchen and bed room because it contains no warm air register and the *only* heat it receives is therefore that which it absorbs from the rest of the house.

But it is not enough to know merely that the air in the storage room is at a higher temperature than the outdoor air and at a lower temperature than the room air of

ture of air in an unheated room and that in adjoining heated rooms, will be one-half of the difference between the temperature of the heated rooms and the outdoor temperature.

This is somewhat of a "thumb rule" and whenever an engineer finds that any rule-of-thumb works out well in practice, he at once dignifies it by the name *empirical rule*.

This plan shows the arrangement of the farm house and the position of the unheated storage room. Just how to figure heat losses for this room, or any similar room is the reason for this article

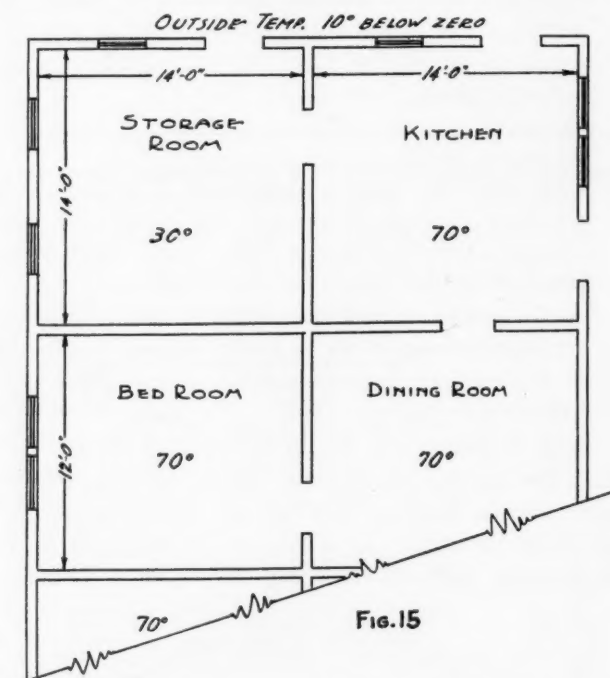


FIG. 15

the kitchen and bed room. We need to know *how much* colder it is than the kitchen and bed room air before we can figure the magnitude of the transmission losses from these latter rooms to the unheated space, because, as was explained in Part II of this series, the rate of heat transmission through a wall depends directly on the *difference* between the air temperature in contact with each side of the wall.

It has become customary to assume that the difference between the tempera-

An empirical rule is one that has been established by test or experience; it has been found to hold true or approximately true for certain fixed or limited conditions and although it is not mathematically correct, it usually has the distinct advantage of simplicity and a reasonable degree of accuracy if used with judgment.

A mathematically correct rule for determining the air temperature in an unheated space like the storage room now under consideration would involve among other and



more complicated variable factors, a consideration of the net exposed wall areas and glass surface of the cold room in comparison with the areas of wall surface separating that room from the adjoining heated rooms, a consideration of the air temperature gradients from floor to ceiling if it is to be a precise rule, etc., etc. The calculations would be quite complicated if all governing factors were taken into consideration and experience in many thousands of cases has shown that such elaborate computations are unnecessary in practical work. It is much better to use a simple, empirical rule like the above and apply it with judgment and ordinary common sense.

Now let's see how the rule works out in this case. The air temperature in the heated rooms is to be 70 degrees when the outdoor temperature is 10 degrees below zero—a difference of 80 degrees between inside and outside temperature. Then according to the above rule, the difference between the temperatures of the heated rooms and the storage room will be one-half of this, or 40 degrees.

#### Heat Loss Calculations

Heat loss calculations for kitchen and bed room are given herewith and any reader who is not accustomed to figuring by the so-called "direct B. t. u. method" and who wants to learn to use this more accurate means of figuring heat requirements, should take a pencil and paper and figure the heat losses for himself. It's not enough to check over someone else's figures. The only safe way to learn is to *do*. It's

so easy to look over someone's calculations and say "Yes, I see that; I understand it"—and then ten minutes later, find that you can't work a similar problem.

#### Details of figuring the kitchen heat losses are as follows:

Glass surface consists of 3 win-

Heat loss factors for an unheated attic with plaster ceiling, attic floor and customary roof construction are given in the table

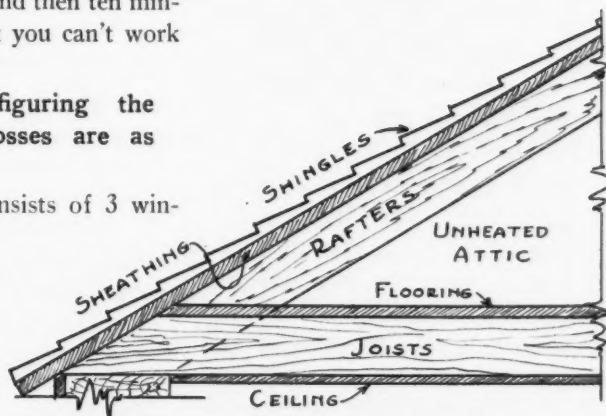


FIG. 14

dows having 15 square feet of surface each and 2 doors having 21 square feet each, a total of  $(3 \times 14) + (2 \times 21) = 87$  square feet. For an inside outside temperature difference of 80 degrees, Section A of the Table of Heat Loss Factors (AMERICAN ARTISAN, April 25, page 30) shows that the heat loss factor for glass is 88.0 B. t. u. per square foot per hour. Therefore, the transmission loss through the glass surface of this room is  $87 \times 88.0 = 7656$  B. t. u. per hour.

Since two walls each 14 feet long and 9 feet high are exposed, the total or gross exposed wall surface is  $(14 + 14) \times 9 = 28 \times 9 = 252$  square feet. Deducting the 87 square feet of glass surface gives  $252 - 87 = 165$  square feet of net exposed wall surface. For an inside-outside temperature difference, Section B of the Table (AMERICAN ARTISAN,

April 25, page 30) shows that the heat loss factor for a frame wall consisting of siding, wood sheathing, studding, lath and plaster is 21.6 B. t. u. per square foot per hour. Therefore the transmission loss through the exposed wall will be  $165 \times 21.6 = 3564$  B. t. u. per hour.

#### Air Changes

According to the table given in Part I of this series (April 25 issue), it is considered good engineering practice to assume that a room with two sides exposed will have about 1.5 air changes per hour due to infiltration of outside cold air. The cubic content of the kitchen is  $14 \times 14 \times 9 = 1764$  cubic feet and 1.5 air changes per hour would give  $1.5 \times 1764 = 2646$  cubic feet of air per hour entering the room by leakage. Section T of the Table of Heat Loss Factors (this issue), shows that the factor for infiltration corresponding to an inside-outside temperature difference of 80 degrees is 1.44 and the heat loss due to leakage will therefore be  $2646 \times 1.44 = 3810$  B. t. u. per hour.

The inside partition separating the kitchen from the cold room has a gross area of  $14 \times 9 = 126$  square feet from which we subtract the 21 square feet of door surface giving  $126 - 21 = 105$  square feet net area. Section Q of the table (this issue), shows that for such an inside partition consisting of wood lath and plaster on each side of 2"x4" studding, the heat loss factor is 11.6 B. t. u. per hour per square foot of wall surface for an indoor-outdoor

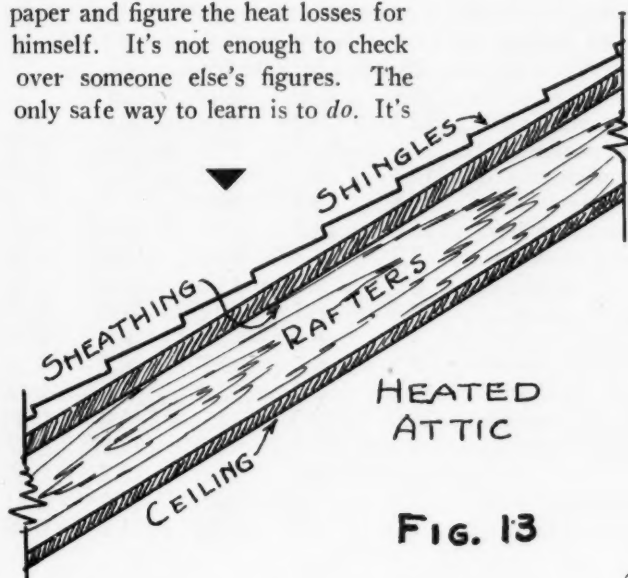


FIG. 13

Heat loss factors for only a roof over an unheated attic space show high losses. The factors are given in the table in this issue

temperature difference of 80 degrees corresponding to a temperature difference of 40 degrees between the two sides of the partition. So the total heat loss from the kitchen through this cold wall is  $105 \times 11.6 = 1218$  B.t.u. per hour.

The door between the kitchen and storage room is taken as glass surface and since the temperature difference between the two sides of the door is 40 degrees, its heat loss factor will be  $40 \div 80$  or  $\frac{1}{2}$  of the 80-degree factor for glass. Thus,  $\frac{1}{2}$  of  $88.0 = 44.0$  B.t.u. per square foot per hour which becomes our heat loss factor for this door and since its area is 21 square feet the total transmission loss through the door is  $21 \times 44.0 = 924$  B.t.u. per hour.

Total losses for this room, thus, are shown in the adjoining column.

In the bed room  $\frac{135}{7965} \times 100\%$   
 $= 1.7\%$  of the total heat loss is due  
to transmission through the cold  
wall. If this were a second floor  
room with cold ceiling and cold par-  
titions on two sides consisting of  
wood lath and plaster on one side  
of the studding only, the total heat

### Transmission Losses

|                                            |       |                 |
|--------------------------------------------|-------|-----------------|
| (a) through outside doors and windows..... | 7,656 | B.t.u. per hour |
| (b) through net exposed wall.....          | 3,564 | B.t.u. per hour |
| (c) through cold inside partition.....     | 1,218 | B.t.u. per hour |
| (d) through cold inside door.....          | 924   | B.t.u. per hour |
| Infiltration loss .....                    | 3,810 | B.t.u. per hour |

|                                 |                        |
|---------------------------------|------------------------|
| Total heat loss of kitchen..... | 17,172 B.t.u. per hour |
|---------------------------------|------------------------|

For the bed room which has one wall in common with the unheated storage room, we find the following losses:

Transmission loss through glass surface:  
 $(15+15) \times 88.0 \dots\dots\dots 2,640 \text{ B.t.u. per hour}$

Transmission loss through outside wall:  
 $[(12 \times 9) - 30] \times 21.6 \dots\dots\dots 1,685 \text{ B.t.u. per hour}$

Transmission loss through partition:  
 $14 \times 9 \times 11.6 \dots\dots\dots 1,462 \text{ B.t.u. per hour}$

Infiltration loss (one air change per hour):  
 12x14x9x1x1.44 ..... 2,177 B.t.u. per hour:

Total heat loss of bed room..... 7,964 B.t.u. per hour

loss would be about 12,600 B.t.u. per hour of which about 8,300 B.t.u. or 66% would be through cold *inside* surfaces. Is it any wonder that heating contractors who fail to take such surfaces into proper account in figuring their work, have complaints of cold rooms?

If any of the foregoing explanation is not perfectly clear or if any reader wants further information along the lines discussed in this

article, please feel free to address inquiries to the writer in care of the AMERICAN ARTISAN. Some letters received in the past have said that the correspondents hesitated to ask what might seem to be "foolish questions." That's a mistaken attitude to take. One of the primary functions of a trade journal is *service* to its readers and that service can best be given if the readers will ask questions.

## HEAT LOSS FACTORS OF BUILDING CONSTRUCTION—(Continued)

| Sec.<br>Q | TYPE OF CONSTRUCTION                                                                                                                                                                                                            | HEAT LOSS FACTOR<br>for difference between<br>inside and outside<br>temperature of |            |            |            | Heat<br>Transmission<br>Coefficient |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------|------------|------------|-------------------------------------|
|           |                                                                                                                                                                                                                                 | 50<br>deg.                                                                         | 60<br>deg. | 70<br>deg. | 80<br>deg. |                                     |
|           | INSIDE PARTITIONS with heated room on one side<br>and unheated on other.                                                                                                                                                        |                                                                                    |            |            |            |                                     |
|           | Assumed difference between temperature of heated room and that of<br>unheated space on other side of partition corresponding to inside-<br>outside temperature differences of 50, 60, 70 and 80 degrees re-<br>spectively ..... | 25<br>deg.                                                                         | 30<br>deg. | 35<br>deg. | 40<br>deg. |                                     |
|           | Wood lath and plaster on ONE side of 2-in. x 4-in. studding....                                                                                                                                                                 | 12.5                                                                               | 15.0       | 17.5       | 20.0       | 0.50                                |
|           | Metal lath and plaster on ONE side of 2-in. x 4-in. studding....                                                                                                                                                                | 13.8                                                                               | 16.5       | 19.3       | 22.0       | 0.55                                |
|           | 3/8-in. plaster board on ONE side of 2-in. x 4-in. studding.....                                                                                                                                                                | 12.5                                                                               | 15.0       | 17.5       | 20.0       | 0.50                                |
|           | 1/2-in. fibre board on ONE side of 2-in. x 4-in. studding.....                                                                                                                                                                  | 7.8                                                                                | 9.3        | 10.9       | 12.4       | 0.31                                |
|           | 1-in. T. & G. yellow pine on ONE side of 2-in. x 4-in. studding...                                                                                                                                                              | 11.0                                                                               | 13.2       | 15.4       | 17.6       | 0.44                                |
|           | Wood lath and plaster on BOTH sides of 2-in. x 4-in. studding...                                                                                                                                                                | 7.3                                                                                | 8.7        | 10.2       | 11.6       | 0.29                                |
|           | Metal lath and plaster on BOTH sides of 2-in. x 4-in. studding...                                                                                                                                                               | 8.3                                                                                | 9.9        | 11.6       | 12.2       | 0.33                                |
|           | 3/8-in. plaster board on BOTH sides of 2-in. x 4-in. studding.....                                                                                                                                                              | 7.3                                                                                | 8.7        | 10.2       | 11.6       | 0.29                                |
|           | 1/2-in. fibre board on BOTH sides of 2-in. x 4-in. studding.....                                                                                                                                                                | 4.3                                                                                | 5.1        | 6.0        | 6.8        | 0.17                                |
|           | 1-in. T. & G. yellow pine on BOTH sides of 2-in. x 4-in. studding                                                                                                                                                               | 5.5                                                                                | 6.6        | 7.7        | 8.8        | 0.22                                |
|           | 4-in. brick wall plain, no plaster.....                                                                                                                                                                                         | 11.0                                                                               | 13.2       | 15.4       | 17.6       | 0.44                                |
|           | Same with 1/2-in. plaster on ONE side of brick (no furring).....                                                                                                                                                                | 10.0                                                                               | 12.0       | 14.0       | 16.0       | 0.40                                |
|           | Same with 1/2-in. plaster on BOTH sides of brick (no furring)...                                                                                                                                                                | 9.3                                                                                | 11.1       | 13.0       | 14.8       | 0.37                                |
|           | 8-in. brick wall plain, no plaster.....                                                                                                                                                                                         | 8.3                                                                                | 9.9        | 11.6       | 13.2       | 0.33                                |
|           | Same with 1/2-in. plaster on ONE side of brick (no furring).....                                                                                                                                                                | 7.8                                                                                | 9.3        | 10.9       | 12.4       | 0.31                                |
|           | Same with 1/2-in. plaster on BOTH sides of brick (no furring)....                                                                                                                                                               | 7.0                                                                                | 8.4        | 9.8        | 11.2       | 0.28                                |

# HEAT LOSS FACTORS OF BUILDING CONSTRUCTION

| Sec. | TYPE OF CONSTRUCTION                                                                                                                                                                                  | HEAT LOSS FACTOR<br>for difference between<br>inside and outside<br>temperature of |                    |                    |                    | Heat<br>Transmission<br>Coefficient |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|-------------------------------------|
|      |                                                                                                                                                                                                       | 50<br>deg.                                                                         | 60<br>deg.         | 70<br>deg.         | 80<br>deg.         |                                     |
| R    | FLOORS ABOVE GROUND with unheated space beneath floor.                                                                                                                                                |                                                                                    |                    |                    |                    |                                     |
|      | Assumed difference between average room air temperature and air temperature in unheated space beneath floor for inside-outside temperature differences of 50, 60, 70 and 80 degrees respectively..... | 25<br>deg.                                                                         | 30<br>deg.         | 35<br>deg.         | 40<br>deg.         |                                     |
|      | 1-IN. YELLOW PINE FLOOR on joists, no ceiling below.....                                                                                                                                              | 11.0                                                                               | 13.2               | 15.4               | 17.6               | 0.44                                |
|      | Same with lath and plaster ceiling below.....                                                                                                                                                         | 7.3                                                                                | 8.7                | 10.2               | 11.6               | 0.29                                |
|      | 13/16-IN. MAPLE or OAK FLOORING on 1-in. sub-floor, no ceiling.....                                                                                                                                   | 8.5                                                                                | 10.2               | 11.9               | 13.6               | 0.34                                |
|      | Same with lath and plaster ceiling below.....                                                                                                                                                         | 6.0                                                                                | 7.2                | 8.4                | 9.6                | 0.24                                |
| S    | CONCRETE FLOORS ON GROUND:                                                                                                                                                                            |                                                                                    |                    |                    |                    |                                     |
|      | Assumed difference between room temperature and ground temperature.....                                                                                                                               | 0<br>deg.                                                                          | 10<br>deg.         | 20<br>deg.         | 30<br>deg.         |                                     |
|      | 4-IN. CONCRETE.....                                                                                                                                                                                   |                                                                                    | 5.6                | 11.2               | 16.8               | 0.56                                |
|      | Same with 1-in. tile or terrazzo flooring on concrete.....                                                                                                                                            |                                                                                    | 5.3                | 10.6               | 15.9               | 0.53                                |
|      | Same with 1-in. pine floor on wood sleepers embedded in concrete..                                                                                                                                    |                                                                                    | 3.9                | 7.8                | 11.7               | 0.39                                |
|      | 6-in. CONCRETE.....                                                                                                                                                                                   |                                                                                    | 4.9                | 9.8                | 14.7               | 0.49                                |
|      | Same with 1-in. tile or terrazzo flooring on concrete.....                                                                                                                                            |                                                                                    | 4.7                | 9.4                | 14.1               | 0.47                                |
|      | Same with 1-in. pine floor on wood sleepers embedded in concrete..                                                                                                                                    |                                                                                    | 3.6                | 7.2                | 10.8               | 0.36                                |
| T    | INFILTRATION:                                                                                                                                                                                         |                                                                                    |                    |                    |                    |                                     |
|      | Cubic feet of air leakage per HOUR multiplied by.....                                                                                                                                                 | 50<br>deg.<br>0.90                                                                 | 60<br>deg.<br>1.08 | 70<br>deg.<br>1.26 | 80<br>deg.<br>1.44 | 1<br>deg.<br>0.018                  |
| O    | PITCHED ROOFS with <i>heated space directly beneath the rafters</i> . (Figure 13.) For loss through <i>unheated</i> attics see next section of table.                                                 | 50<br>deg.                                                                         | 60<br>deg.         | 70<br>deg.         | 80<br>deg.         | Heat<br>Transmission<br>Coefficient |
|      | WOOD SHINGLES on wood strips spaced 2-in. apart, no ceiling...                                                                                                                                        | 24.0                                                                               | 28.8               | 33.6               | 38.4               | 0.48                                |
|      | Same with lath and plaster ceiling on under side of rafters.....                                                                                                                                      | 15.0                                                                               | 18.0               | 21.0               | 24.0               | 0.30                                |
|      | Same with 1/2-in. plaster on 1/2-in. fibre board plaster base.....                                                                                                                                    | 10.5                                                                               | 12.6               | 14.7               | 16.8               | 0.21                                |
|      | ASPHALT or ASBESTOS SHINGLES or COMPOSITION ROOFING on 1-in. wood sheathing, no ceiling.....                                                                                                          | 26.0                                                                               | 31.2               | 36.4               | 41.6               | 0.52                                |
|      | Same with lath and plaster ceiling on under side of rafters.....                                                                                                                                      | 15.5                                                                               | 18.6               | 21.7               | 24.8               | 0.31                                |
|      | Same with 1/2-in. plaster on 1/2-in. fibre board plaster base.....                                                                                                                                    | 11.0                                                                               | 13.2               | 15.4               | 17.6               | 0.22                                |
|      | SLATE or TILE on roofing felt on wood sheathing, no ceiling...                                                                                                                                        | 27.5                                                                               | 33.0               | 38.5               | 44.0               | 0.55                                |
|      | Same with lath and plaster ceiling on under side of rafters.....                                                                                                                                      | 16.0                                                                               | 19.2               | 22.4               | 25.6               | 0.32                                |
|      | Same with 1/2-in. plaster on 1/2-in. fibre board plaster base.....                                                                                                                                    | 11.0                                                                               | 13.2               | 15.4               | 17.6               | 0.22                                |
| P    | CEILING AND PITCHED ROOF (Figure 14) Combined factor for horizontal ceiling, <i>unheated</i> attic and pitched roof.                                                                                  |                                                                                    |                    |                    |                    |                                     |
|      | WOOD SHINGLES on wood strips spaced 2 ins. apart, lath and plaster ceiling, NO ATTIC FLOOR.....                                                                                                       | 13.5                                                                               | 16.2               | 18.9               | 21.6               | 0.27                                |
|      | Same with 1-in. attic floor.....                                                                                                                                                                      | 9.0                                                                                | 10.8               | 12.6               | 14.4               | 0.18                                |
|      | Same with ceiling of 1/2-in. plaster on 1/2-in. fibre board, NO ATTIC FLOOR.....                                                                                                                      | 9.5                                                                                | 11.4               | 13.3               | 15.2               | 0.19                                |
|      | Same with 1-in. attic floor.....                                                                                                                                                                      | 7.0                                                                                | 8.4                | 9.8                | 11.2               | 0.14                                |
|      | ASPHALT SHINGLES                                                                                                                                                                                      |                                                                                    |                    |                    |                    |                                     |
|      | ASBESTOS SHINGLES                                                                                                                                                                                     |                                                                                    |                    |                    |                    |                                     |
|      | COMPOSITION ROOFING                                                                                                                                                                                   |                                                                                    |                    |                    |                    |                                     |
|      | SLATE and roofing felt                                                                                                                                                                                |                                                                                    |                    |                    |                    |                                     |
|      | TILE and roofing felt                                                                                                                                                                                 |                                                                                    |                    |                    |                    |                                     |
|      | Any of these on wood sheathing, lath and plaster ceiling, NO ATTIC FLOOR.....                                                                                                                         | 14.0                                                                               | 16.8               | 19.6               | 22.4               | 0.28                                |
|      | Same with 1-in. attic floor.....                                                                                                                                                                      | 9.0                                                                                | 10.8               | 12.6               | 14.4               | 0.18                                |

AIR 0070-1-0700 07-70-1-0700



# Winding Up the Campaign for Sheet Metal Jobs Around the Home

## **Fabricated of sheet metal!**

We can make no end of interesting things for your home out of sheet metal—anything from a flower box to an interestingly designed cornice, a neat curbing for your driveway—or for flower beds—a ceiling for your basement. Cleanliness and safety are served by lining the coal room with sheet metal. We'd like to show you what can be done.

**Send the attached card. We'll give you full details in person, and for such fabricated jobs we're making a special discount of 10%, on cards received by . . . . . Send yours now.**

THIS is the second and concluding part of the campaign, which we commenced running in the June issue, on sheet metal jobs around the home. In the June issue we carried the copy for five postal cards in the campaign. The first three had to do with repairs to gutters and downspouts; the last two covered other jobs around the home, one on flashings and the other on the miscellaneous items which may be fabricated out of sheet metal for home use.

In the present issue we give you the copy for the last of the six postal cards in the campaign, and the return card copy. Again we cover the various types of jobs for which sheet metal can be used.

Before going on to the sales letters which we are including in this issue, let's review for a moment the idea of the campaign, and the ideas back of it. In the first place, don't let that word "campaign" make you think that we're talking about a big, expensive effort. We aren't.

But we insist on the campaign

idea—that is, a series of efforts with some connecting link between each of them. It may last only a week, and it may not cost you much more than the time you put into it, but if you've made two or three stabs at selling some specific kind of job, you've put on a campaign. If you have a window, let's say, and you've had a display of the kind of job you're trying to sell; if you've called up some of your customers to talk about that kind of job; and if the newspaper ad, or the sales letter, or the blotter, or the envelope stuffer you used that week talked about the same thing—you've put on a campaign. When we talk about campaigns here we mean selling efforts thought out in advance and aimed at one general objective.

In the copy for the cards in the last issue, where we were talking about gutters and downspouts, we kept close to the idea that sagging gutters and downspouts spoil the appearance of the house—and then went on to the damage which would be done by water escaping from

▲  
Here is the copy for  
the last of the postal  
cards. We gave copy  
for five in our June issue  
▼

such broken metal work. Flashings, of course, were covered from the angle of leaks and the possible danger to interior decorations. Then we went after the job of acquainting the home owner with the many things which a clever sheet metal artisan can fashion. We talked about flower boxes, curbing, lining coal rooms, putting in basement ceilings, — stressing the fact that these things look smart when they are fabricated of sheet metal.

The card in the present issue carries on that same thought, under the headline: "Fabricated of sheet metal!" And the sales letters which we give you with this article develop the same thought.

None of this is expensive, and if you go at it in the right way the very small sum of money which you may spend for these mailings should return a nice dividend.

The average retailer, when he is asked to think about getting out some direct mail matter, begins to think about all the names of all of his customers and prospects. As a consequence, he mails a lot of stuff to people who aren't in the market for the thing he's talking about. He does this because, when any one gets to thinking about a hundred or two hundred names, he can't keep in mind all of the facts about all of those houses and their owners—even if he knew them.

So this is the first step in a mailing campaign like this one: Sit down and, either from memory, or by checking over your lists of customers and prospects, get down the names of those where you know there is money to be spent, and where you know enough about the home to feel reasonably sure that your sales appeal will have reason to be heard. This operation may reduce the first mailing to twenty, thirty, or fifty names. But that mailing will be many times more

effective, because you know just where the material is going, and why it has a chance to be effective. Once that job is out of the way, check back again over your names, look to the sources of information on all those names. You may have a man who has worked on dozens of those houses, and he will know something about the condition of the sheet metal work—if you don't keep an inspection report file which, of course, every contractor should have.

Thus you exhaust your list, in batches of a sufficiently low number so that, if you decide to follow up your mailing with telephone calls, you can talk to each person with accurate information about conditions around the house, and so have a better chance of making an intelligent sales presentation.

There isn't a contractor in the country who has been in business for some time who couldn't check over his old customer list alone and remember something about each one of those homes which would give him a chance to open up with a sales talk. And in these days the process described will make it possible to devote the entire sales effort

toward those people who have the money to buy if they can be convinced that they need what the contractor has to offer.

It takes time. Granted. But it may as well be said here that the man who has time to sit around his place of business talking about how little work there is to be had, has the time to put into this selling job. We are in the midst of profound changes in this country.

Only one fact is certain: Whatever changes are made in the interests of more efficient distribution and selling, the local retailer who has proved his merchandising ability will still be in the picture; and he may very well be in a more commanding position than ever before because he will not have lost momentum by merely coasting along. If he has kept his name before his community he will find it easier to get the business which must ultimately be created. We'll need more homes and old homes will need repairs.

Here is the campaign—in the two issues you have it complete. Make use of the material as suggested in this article, send us samples, and tell us what results you obtain.

A couple of sales letters, one on flashings (to back up the card in the last issue) and one on things that can be fabricated of sheet metal

ADVANCE SHEET METAL CONTRACTORS  
No. 5 Main Street  
City

Mrs. Howard Smith,  
223 So. 7th St.,  
City.

My dear Madam:

A great many people do not know that some of the ornate decorations on large buildings, on church steeples, etc., have been fabricated of sheet metal.

You may be asking yourself what connection there is between such buildings and your home. Just this: There are a number of things for the home which may be fabricated of sheet metal, as smart in appearance as the decorations on these larger buildings.

You will, for instance, appreciate the lasting qualities of flower boxes made of sheet metal. Then think of the automobile driveway. To curb it with brick or cement is an expensive process. We can make such curbing of sheet metal which will give a smart finish to the drive, at a very small cost.

We are recommending, for safety and cleanliness, the lining of coal rooms with sheet metal. You know how coal dust spreads while a load is being delivered. With such a lined room, and the door closed, you can fill the coal room without having to do a complete basement cleaning job afterward—or finding the coal dust in the house.

Won't you telephone and let us know when it will be convenient to talk with you about one or more of these smart sheet-metal-fabricated jobs? We'll be glad to call at any time you suggest and without cost. You will be interested in having further details.

Very truly yours,  
ADVANCE SHEET METAL CONTRACTORS.

ADVANCE SHEET METAL CONTRACTORS  
No. 5 Main Street  
City

Mrs. Howard Smith,  
223 S. 7th St.,  
City.

My dear Madam:

When the heavy summer rains come, are you certain that there will be no leaks to stain your walls or ceiling?

One of the places where, in the older home, such leaks are apt to occur is where the chimney meets the roof, or where the porch or bay window joins the wall, or where gables on the house form valleys in the roof.

In order to seal such places against leaks we make a "flashing"—which covers completely and tightly such joints which, because of their nature, cannot be made watertight. If, during the spring rains, you've noticed any stains, we'd suggest that now is the best time to have the flashings looked to before further damage is done.

At the same time, may we call your attention to the fact that guttering and downspouts should be looked to just now. Not only does a sagging gutter or broken downspout mar the appearance of the home, but neither can it serve its purpose of carrying rainwater into the storm sewer. Such leaks will stain outside walls, rot wood surfaces, cause cracks in stucco, seep around foundations and cause settling, and wash out flower beds.

We'll be glad to send a competent man at any time convenient to you to inspect your home for needed repairs. There is no charge for this inspection. Just telephone.

Very truly yours,  
ADVANCE SHEET METAL CONTRACTORS.



# Mutual Home Building Dayton, Ohio's Metal Trimmed Skyscraper

**D**AYTON, OHIO, has a new office building which undoubtedly is one of the finest structures in the state. This building, the Mutual Home and Savings Association building, is designed along modern lines with weight saving curtain walls, a minimum of ornamentation, and the straight lines and facades typical of this architectural trend.

The building was designed by the architectural firm of Schenck and Williams of Dayton.

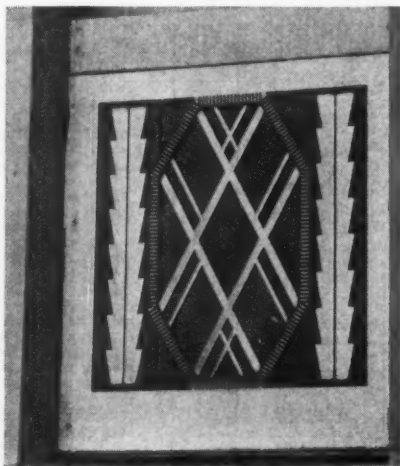
The building is really an indented corner tower with a low rear section set behind the end walls of the front section. The front section is set back at the third floor.

On the main facade and in the four indented corners there are alternate vertical panels of windows and cast aluminum spandrels. For the entire building there were used some 293 spandrels of three sizes and designs. These spandrels were especially designed for the building

by Maxfield H. Keck of New York, who also prepared the design for the large amount of ornamental interior aluminum work used in the banking floors and at the entrance.

## The Spandrels

The spandrels were cast and finished by the Crown Iron Works of Minneapolis. This firm also cast



A closeup view of one of the cast aluminum spandrels showing three finishes—sandblast, satin and high-lighted

and prepared the ornamental metal work used throughout the building.

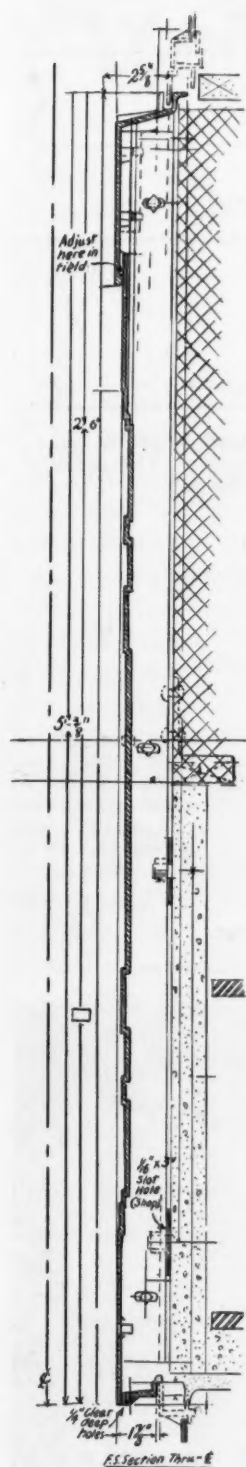
One of the photographs and one of the detailed drawings show the features of these spandrels. The face is a combination of sand blast finish background, with the ornamentation highlighted and all other surfaces given a satin finish. The result is a spandrel presenting three finishes for the play of light and shadow. How artistic is this effect may be seen from the photographs.

The spandrels were cast in three sizes to fit the needs of installation. The design inside the border was varied with the change in width resulting in the elimination of the "keystone" vertical strips.

One of the details shows a cross section of the spandrel. On this detail attention is called to the special provision used to hold the spandrel to the wall. A continuous "Z" extruded aluminum section was bolted to the back of the spandrel. An aluminum angle in turn was bolted to an "Anchorite" insert. Both these sections are continuous for the full height of the spandrel. When the spandrel was placed in position a tap was run through the angle into the "Z" section and drawn tight.

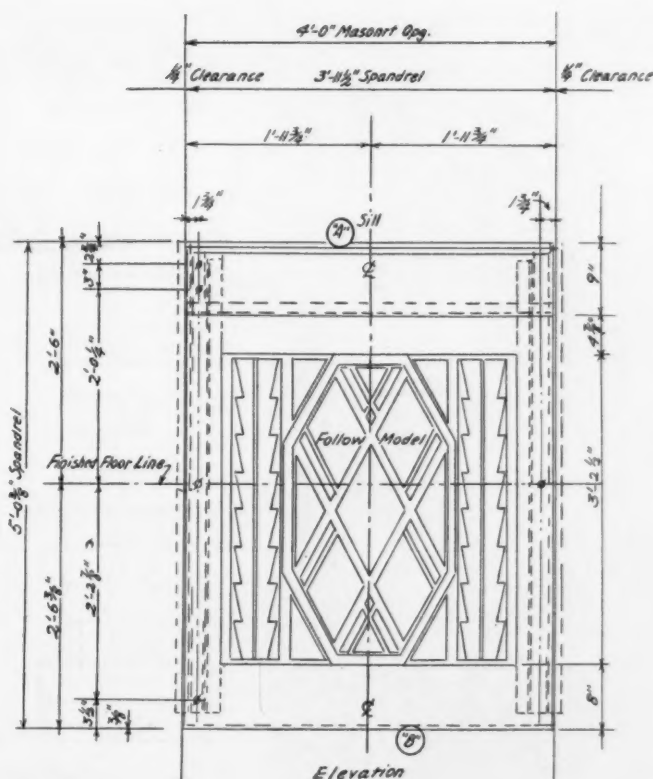
The windows used on the build-





At the left is a spandrel cross-section showing general dimensions, assembly and wall backup. All edges are caulked for water tightness

The elevation of the spandrel indicates the sizes and design and location in the wall. Upper and lower sill construction can be seen in the cross-section drawing



piece flashing and fabricated as indicated in one of the details. The height of the flashing varies from a few inches to more than one foot.

#### Stone Joint Cap

Around all setbacks and decks there is a stone-topped coping. In order to prevent water penetration into the stone joints a special aluminum sheet cap was designed and installed as shown in the drawings. The cap extends several inches beyond the joint with the ends caulked into the stone with lead. The cap is brought over the two edges and turned against the stone.

The flashings and coping caps

were all fabricated and installed by the Rieck Sheet Metal Company, of Dayton.

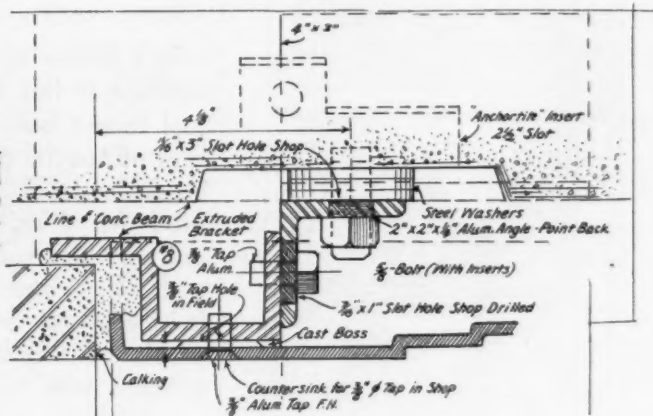
Throughout the inside of the building there is a wealth of ornamental and service metal work. For example, throughout the office floors aluminum doors, such as the one shown in the photograph and detailed in a drawing are used. The finish is satin sand blast giving a slightly rough surface. Modernistic moldings are used with small, but artistic, lock panels. This type of door results in considerable weight saving in addition to providing durability.

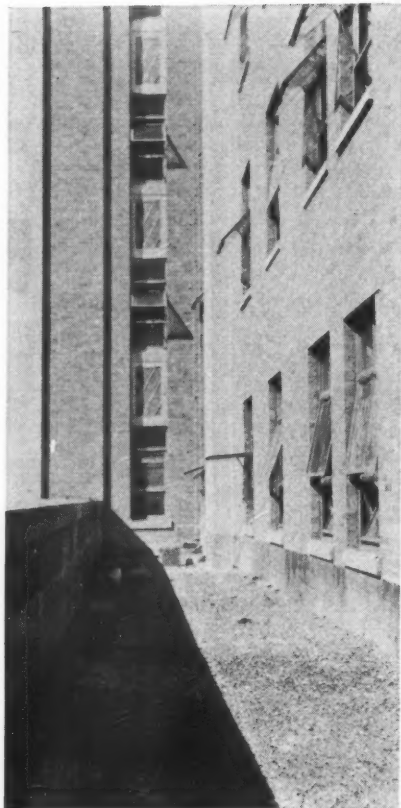
On the bank floors there is an

ing are all metal harmonizing in color with the spandrels. The window sections are so designed that the upper portion is stationary, the center portion swings out, while the lower section swing inward. The photographs show details of the construction and operation.

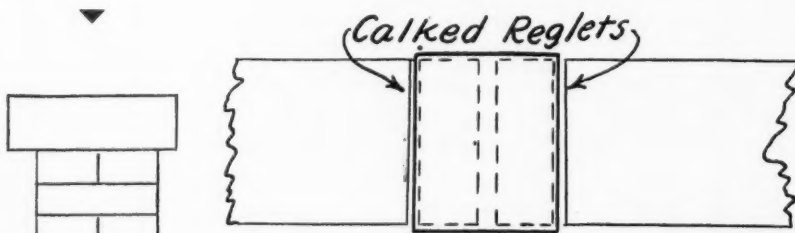
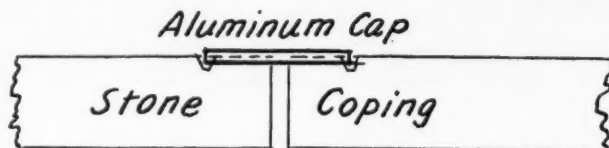
One of the interesting features of the building is the protective metal work. All flashings around the different set backs and decks are aluminum sheet, applied as two-

This drawing shows the special anchor used. Tap holes, slotted, provided some adjustment

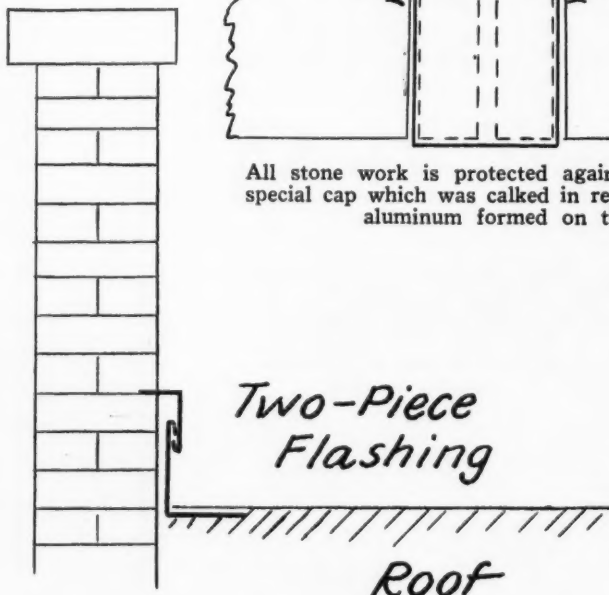




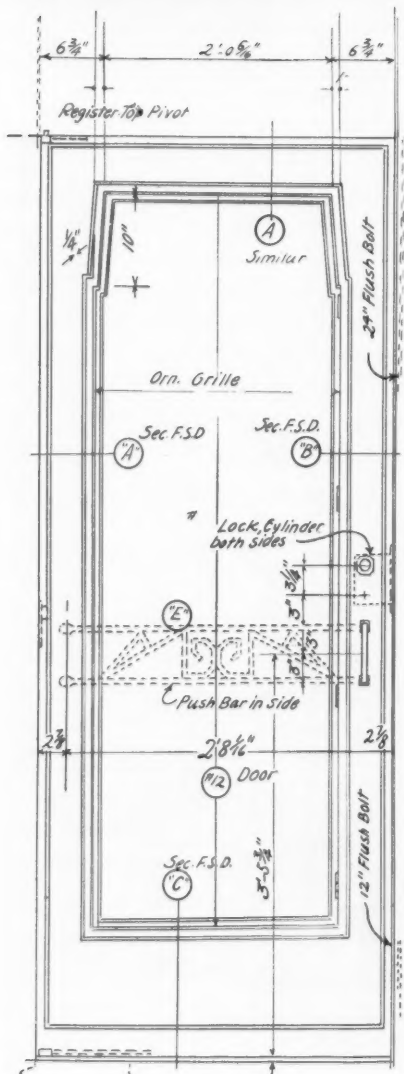
The photograph, left, shows a deck with high flashing and coping joint protection



All stone work is protected against water by this special cap which was calked in reglets. The cap is aluminum formed on the job



The flashing follows this construction. At some points extremely wide sheets had to be used

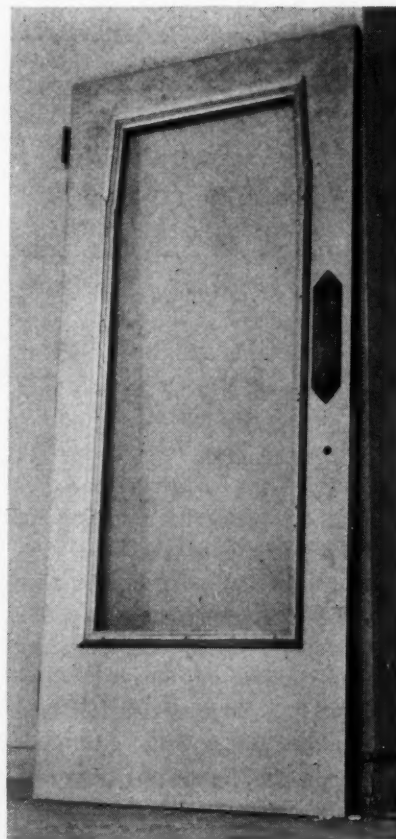


ornamental clock face of cast iron, complete extruded aluminum trim for counters, vestibule, check desks and seats. There are also aluminum lanterns outside the entrance. The ornamental grilles at the main entrance are cast aluminum with a dust blast finish, highlighted for shadow effect.

All this metal work was furnished by the Crown Iron Works.

The building has received a great deal of commendatory comment locally and nationally with a considerable portion of this comment referring to the metal work.

In addition to the metal uses outlined in this article, the Mutual Home building uses metal sash of special design. On the inside metal in many forms is used for trim, ornamentation and service throughout the bank and office floors. The building is, therefore, an excellent example of modern architecture coupled with modern materials—principally metal.



The drawing, left, and this photo show details of some of the aluminum doors used throughout the building

# Will I Get My Money?

Is undoubtedly one of the most pressing questions of the year. Here is a working plan which has answered the question in Pittsburgh

By J. E. Davis

**C**ONDITIONS under which the Construction Industry was operating in 1929 was an outgrowth of the enormous deficiency of general construction during and immediately following the war. Wartime restrictions and the abnormal financial conditions, especially around 1921, set the stage for an extensive building boom.

People in all walks of life were in the market for residences. Individuals such as mechanics, laborers, office workers, barbers, began the construction of homes. Some of these people, being unemployed or employed only part of the time worked as assistants and helpers in constructing their own residences. It was rather a common occurrence for one of these home-builders to receive such an attractive offer to buy the newly completed residence that he sold it—and overnight became a speculative builder.

When competition among suppliers of material became a little more severe, these builders rather quickly learned they could obtain all necessary material—and often the labor, through sub-letting practically all the work, with the understanding that they would pay nothing whatever until the structure was sold.

## Pittsburgh's Plan

The leading contractors and supply dealers of Pittsburgh, all vitally affected by these changing conditions, with the zeal and courage of pioneers, began to search for the cause of chaos in the building industry. They reviewed and analyzed the pernicious practices of the peddling of bids, depending upon Mechanics' Liens and Surety Bonds

in lieu of sound principles of credit, striving for an ever increasing volume regardless of prices or profits, and the total disregard for cooperation and coordination of effort—and found these to be some of the contributing causes of a serious situation which only sound credit policies and sane credit practices could correct and cure.

## Our Credit Tangle

Regardless of the avenue through which these leaders approached their complex problems, inevitably the trail led them to some phase of the credit tangle. Due to the fact that some reaction of the credit structure appeared to affect every factor in the great industry, these men, vitally concerned as they were, decided to launch a program for co-operative credit control.

After careful analysis of the various plans and proposals in other markets, they concluded that any plan to be permanent and powerful must be constructive, and founded on facts, not destructive and dependent upon force.

The agency through which to bring about coordination of credits, they concluded, must be a credit organization of the highest caliber and thoroughly detached from the business interests of any dealer or contractor.

Early in 1930 the Consolidated Construction Industries came into being. It was organized as a division of the Credit Association of Western Pennsylvania, which in turn was a part of the National Association of Credit Men.

From its inception the Consolidated Construction Industries has

been conducted upon the principle that its chief function is to search out and present facts. Its value is measured entirely by the intelligent use of pertinent facts made available.

The program as finally put into operation embraced the unique feature of placing at the disposal of every sub-contractor who affiliated himself with the movement, the entire resources of the fact-finding bureau to give to him as well as the dealers, the complete picture of the projects into which he puts his time, thought and material.

The sub-contractor is given every possible assistance to help himself.

To the sub-contractor member one of the most important features is what is known as the Construction Report. On request of any member, the staff of employees of the Consolidated Construction Industries makes a thorough investigation, seeks out the facts and presents them in a report form.

## Typical Reports

No two reports can follow the same form exactly but in general the following information is verified:

A. The principals at interest, such as Owner, Architect, General Contractor and Sub-Contractor.

B. Surety, Scope of Bond, etc., if any.

C. Location, type of building, etc.

D. County records of property showing name of title holder, mortgages, liens or other encumbrance.

E. Owner's plan of financing the cost of the project; verification

(Continued on page 40)



# Comfort Cooling For Homes

By H. J. Macintire

[Part II]

**A series of articles discussing the basic principles of cooling and the application of present equipment and methods now in use**

**T**HERE are several ways of cooling air; either by sprays, by the use of refrigerator coils or by a combination of the two. The air is brought into contact with atomized water cooled to a temperature sufficiently low so that the final temperature of the water will be slightly lower than the desired dew point temperature. The older method is to use direct expansion or brine coils flooded with refrigerated water.

If the house is provided with a warm air system of heating, the problem of cooling becomes a very easy one. The air is cooled to the proper dew point temperature and is circulated through the risers to the different rooms. In some cases where warm air heating is not provided, additions can be made so as to carry the air from the basement to the room or rooms to be cooled. However there are now a number of desirable unit coolers which can be designed complete with refrigerating machines or with a central refrigerating machine located in the basement. These unit coolers can be located in a convenient point in the room or can be built into the wall.

In order to maintain a lowered temperature within a building (like keeping a well or a boat bailed out) the heat leakage, the heat equivalent of the power and lights and that heat generated from any source whatsoever must be removed as fast as it enters the structure. It is similar, but more exacting, than is the case of keeping a comfortable temperature in a house in the winter time.

The principal sources of the gen-

eration of heat are solar radiation through the glass of the windows, heat leakage through the walls and the roof, the fresh air entering by infiltration at atmospheric temperature and humidity through the cracks of the doors and windows and the fresh air admitted through the doors and by the fresh air ducts. To a much lesser extent, except when entertaining, the residence will be heated by the people present, by electric lights and by the power used, but these need not be calculated except when the amount of heat involved is unusual.

## Heat Leakage

As is seen in the summary, the amount of necessary cooling figured for the typical small residence shown in the figure depends to a very large extent on the heat leakage. It will be noted that a part of

the ceiling is roof, and that although the plans call for some insulation yet it is pitifully small, being only ½-inch of rigid insulation placed in the air space. The heat leakage in the walls is figured from the formula:

$$H_t = AU(t - t_o)$$

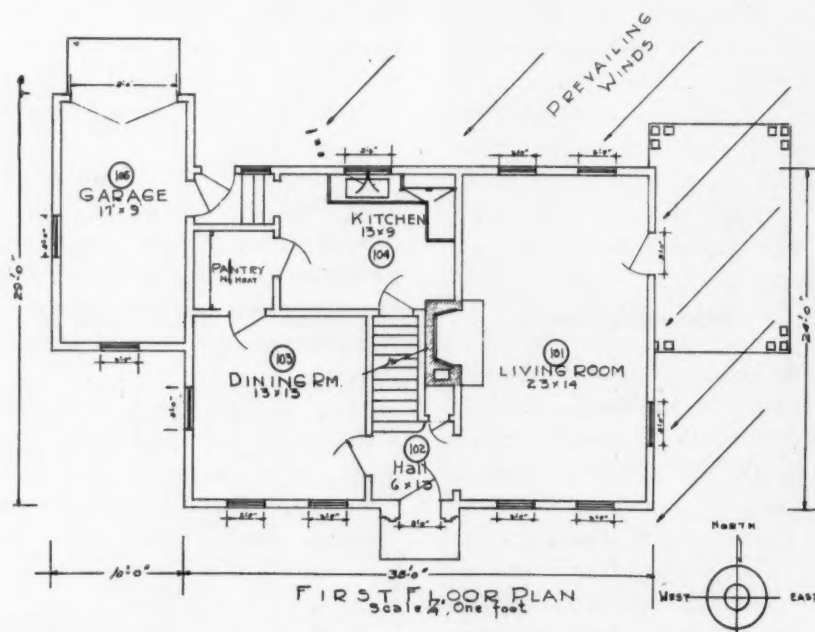
where  $H_t$  = the B.t.u. per hour transmitted through the walls, glass, doors, etc.

$A$  = actual area in sq. ft. of the walls, doors, glass, etc.

$U$  = coefficient of heat transfer for the built up sections or glass in B.t.u. per hr. per sq. ft. per degree temperature difference.

$(t - t_o)$  is the temperature difference between the inside and the outside air temperature.

The total wall area in this problem is 1,226 sq. ft. and with a value of  $U$  of .0152 taken from the A. S. H. and V. E. Guide and an assumed difference of temperature of



The plan shows the size of the house, the direction of prevailing winds and general construction of wall and glass area, etc.



The front elevation is for a frame house, large roof area, and much glass

(90-80) the heat leakage into the house will be for the Wall—

$$H_t = 1226 \times 0.152 \times 10 = 1864$$

B.t.u. per hour

It is very true that the side exposed to the sun will have a surface temperature greater than 90 deg. F. and that an allowance should be made for this fact. Also the roof may become unbearably hot and a temperature of 40 or more degrees should be added to the outside temperature of the air, especially where the roof is also a ceiling as is partly the case in the problem. An allowance of 15 deg. F. only is made in the calculation of the roof heat leakage without any attempt at calculation of the area of roof perpendicular to the direction of the rays of the sun. For the roof, using a value of  $U$  from the Guide as before:

$$H_t = 1260 \times 0.190 \times (115-80)$$

roof = 5980 B.t.u. per hour

Likewise there is 226.5 sq. ft. of glass, which with  $U=1.13$  becomes

$$H_t = 226.5 \times 1.13 \times 10 = 2560$$

B.t.u. per hour.

Total heat leakage = 10,404 B.t.u. per hour.

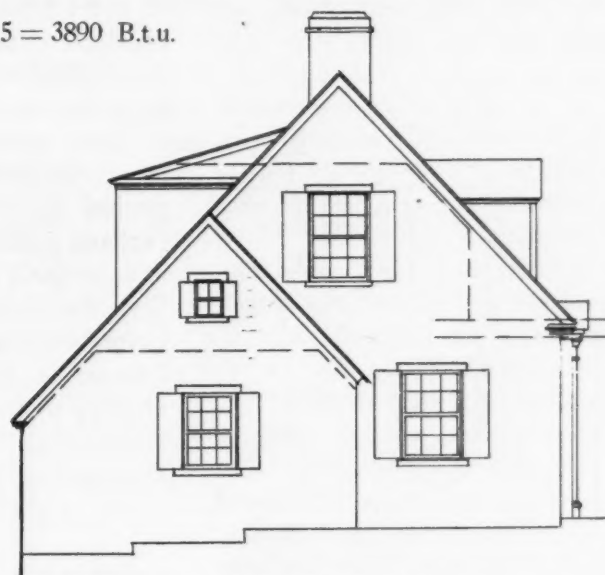
#### Infiltration

A building designed for comfort cooling must be kept *closed*. All windows are understood to be shut tight as would be expected in winter operation when ventilation has been properly attended to. It is a

physical impossibility to make any other kind of a design, for one cannot refrigerate the atmosphere. Fresh air must enter by infiltration and by the proper allowance through the fresh air duct. In the present design, using the value in the Guide for double hung wood sash windows with uncalked frames, of 11.3 cu. ft. per foot of crack per hours, there will be  $364 \times 11.3 = 4120$  cu. ft. per hour through the windows and  $630 \times .05 = 32$  cu. ft. per hour through the walls, which make a total of 4152 cu. ft. per hour of outside air by infiltration, which is about half the volume of the first floor. This amount of air, taken at 90 degrees and 70 per cent relative humidity, which is to be cooled to 80 deg. F. and 50 per cent relative humidity, will require about 12.5 B.t.u. per pound of dry air, or a total of

$$H_{air} = \frac{4152}{13.35} \times 12.5 = 3890 \text{ B.t.u.}$$

One end elevation shows that the high percentage of glass to wall exists on all faces and that the second floor is badly exposed through the roof



per hour where 13.35 is the volume of 1-lb. of bone dry air at 90 deg. F. and 70 per cent humidity.

#### Solar Radiation

According to Walker, Sanford and Wells in their paper, "Field Studies of Office Building Cooling," direct solar radiation through the windows may assume very large proportions. In this paper it was determined by direct measurement that direct sunlight gave 160 B.t.u. per hour per sq. ft. of glass on the east and west sides and 140 B.t.u. per sq. ft. per hour on the south side, all three actually exposed to the rays of the sun. On account of the angle of the rays at noon time the south windows are less exposed than are the east and west ones. Also any projection in the building construction that will cast a shadow on the windows, or the use of awnings that will protect the glass from direct sunlight will prevent the entrance of this solar heat.

In the present case the maximum solar radiant heat will be produced when the sun can shine in both the south and east windows at about 10 A. M. in the morning or in the south and west windows at about 3 P. M. in the afternoon, and 6250 B.t.u. per hour is the maximum radiation.

The total refrigeration then becomes: [Table I]

### Conclusion

In an analysis of the foregoing it is very evident that the amount of 1.77 tons of refrigeration is absurd for the usual house costing from \$8,000 to \$12,000, and it is worth

be properly constructed for comfort cooling as well as winter heating. The air spaces in the walls and the roof should be filled with a good insulation. The roof should never be a ceiling, but if it is the insulation should be very generous,

Using the present plans, with awnings, double glass and a well insulated roof and walls the total refrigeration can be reduced to 7650

$$\text{B.t.u. per hour or } \frac{7650}{12000} = 0.637$$

tons.

It is quite possible that the amount of fresh air in the above calculation, a large amount of which will now have to come from the fresh air duct, will not be sufficient, and the amount may be increased. If so, the refrigeration required may be reduced per pound of bone dry air by not cooling the air low enough to reduce the humidity to 50 per cent or perhaps an ozonator will be found satisfactory without increasing the amount of air. However, it goes without argument that comfort cooling for the entire house spells better building planning and much better construction.

TABLE I

|                                                 |                                               |
|-------------------------------------------------|-----------------------------------------------|
| Heat leakage through the walls.....             | 1864 B.t.u. per hr.                           |
| Heat leakage through the roof.....              | 5980 B.t.u. per hr.                           |
| Heat leakage through the glass.....             | 2560 B.t.u. per hr.                           |
| Infiltration, cooling and dehumidification..... | 3890 B.t.u. per hr.                           |
| Solar radiation through the glass.....          | 6250 B.t.u. per hr.                           |
| Total.....                                      | 20,544 B.t.u. per hr.<br>1.77 tons of refrig. |

while to see what can be done to cut down on the amount of cooling required. First the residence should have awnings on the east, south and west sides of the house which would have the effect of removing the heat due to direct solar radiation.

In addition the residence should

and 1/2-inch rigid insulation is hardly a beginning. If double (storm) windows have been provided for the winter, there is no excuse for not using them in the summer and thereby operating with coefficient of heat transmission of 0.45 instead of 1.13 for single glass.

## Will I Get My Money?

(Continued from page 37)

of cash, securities, or other assets owner may claim to have available.

F. General reputation, standing, occupation, etc., of the owner.

G. Financial condition, paying habits, performance record of previous projects and other vital information about the general contractor.

H. Information on any sub-contractor similar to that on a general contractor, mentioned above, but made available only to those who may have a proper credit interest.

It is not possible for anyone to obtain from this fact-finding organization a report merely for the purpose of getting a line on some competitor.

So long as a job is under construction any member may request and obtain any additional information pertaining to the job. In this case, all who received the original report are sent without request all subsequent information.

Projects not properly financed have been abandoned before a great deal of loss was suffered by sub-contractors, due wholly or in part to

"Our company unqualifiedly endorses the splendid work of this department of the National Credit Men's Association. The information received has enabled us to side-step many bad credit losses—and quite a few of them from customers whose previous record with us was good—but who were going into projects not properly financed.

"Like many worthy movements this one has not been supported as it deserves to be. Perhaps publication of the plan in your good journal will arouse, first, the interest of every Pittsburgh contractor and second, interest in other parts of the country where this plan is badly needed to improve building construction credits."

(Signed) J. E. Davis.

the publicity made possible by the Bureau Owners. Many people contemplating the erection of a new home or building, ignorant of their own liability in allowing irresponsible contractors to build on their land, have been saved from serious difficulties and losses.

The performance records of many contractors and builders have been built up and carefully verified. As a result of these records, a public job recently was awarded to a responsible firm on a bid nearly 12 per cent higher than the low bidder whose performance record was not satisfactory. Although the unsuccessful bidder had a good pay record and offered a surety bond as evidence of responsibility, those in authority declined to award the job to the low bidder. Within a few months this concern was hopelessly involved, and left supply dealers and sub-contractors (principally outside the Pittsburgh district) "holding the bag" for some \$40,000 to \$50,000.



## Some Comment on the Use of Basement Air

**W**ITHOUT much question, the proposition of using the basement as a return air chamber, has created more comment than any question of recent months. Of much interest in this controversy is the seemingly endless objections raised by men long identified with warm air heating ramifications.

A typical comment on this problem is exemplified by a letter written by Homer F. Brundage, President of The Brundage Company, Kalamazoo, Michigan, manufacturers of furnace blowers and washers. Mr. Brundage says:

"For two perfectly good reasons, if for no others at all, the use of the basement as a return chamber ought to be prohibited by law. If for any reason the basement should be placed under a partial vacuum, either by restricted cold air or by the lady of the house or if any member of the household, whether it be servant, man or woman, should obstruct the cold air in any way by throwing a rug or certain types of furniture or the like over the cold air return, the fan, remember, will still be pulling air from the basement.

"Now we will grant that in the newer homes at least the basement is fairly tight so that the amount of leakage around windows and doors

and infiltration of any kind will be limited. In that event where is the fan going to get its air after it has used up the air that is in the basement? Now there is only one place and that is right down the chimney out the fire door, into the fan and directly up into the house. With this you will pull not only fire in the case of a coal fired job but gas fumes as well. In the case of oil fired and gas fired furnaces you might not pull any fire, but you'll put the fire out and pull gas fumes up into the house so quickly with the fan that it might even kill the people in the home before they would even know what hit them.

"We had a case in Kalamazoo here a short time ago where for some unknown reason the gas fumes leaked into the basement of a home from the main out in the street, followed the pipe line into the house and got into the basement. This particular furnace had a fan on it, if I am informed correctly, and the result is that four members of a large family are dead and the balance of the family have got to take a year's trip for their health.

"Secondly, there is no more air in the basement in a great many homes at the present time than is required to support combustion. In fact, I have known of basements where additional air had to be let into the basement to support com-

bustion. In a case of this kind, what would we do with a fan pulling directly from a basement?

"Another argument, which of course is not serious from the standpoint of danger, but adds to the cost of the job, is the fact that the heat loss of the house is increased from 25 to 30% in the event that the air returns are dumped into the basement, due to the fact that you have got to condition all of the basement air as well as the first and second floors in a home. This adds greatly to the size of the equipment necessary which as I say is not dangerous, but adds to the expense of the job.

"There undoubtedly are a number of other reasons of less importance, such as basement dirt coming back up through the register, pulling of odorous air in through the furnace and bear in mind that a washer will not wash odors out of the air as some of our kind friends would like to make the public believe.

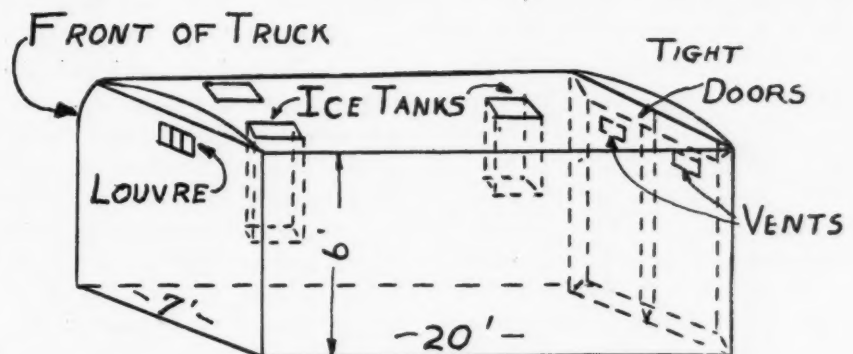
"There is another very dangerous point—in the event that a fire should start in the basement and the fan shouldn't happen to be running, the cold air opening to your first floor would make a beautiful chimney for your fire to travel right upstairs. In the event fire should start when the fan is operating, fire would be pulled right through the fan, through the furnace up to the upper floor."

## How Would You Ventilate This Truck?

**A**CCOMPANYING this item is a sketch of a truck which a reader is called upon to ventilate. The truck has a refrigerated body with ice compartments as shown. There will probably be two ice tanks at the front and either one or two tanks at the rear.

The problem is to maintain the same temperature at the front area as at the back whether the vehicle is standing still or moving. The body is heavily insulated, of course, and has ice box doors.

The contractor wonders if a louvre at the front against the driver's cab and two louvres at the rear, one in each door, will create just the



kind of interior circulation which will keep the temperatures uniform front and back and at the ceiling and floor.

Presumably the interior temperature will be between 38 and 40 de-

grees F.

If any reader has handled a problem of this kind, or has ideas which will assist this contractor, we shall be glad to have sketches and detailed information.

# A Transition Elbow— Square To Square

By L. F. HYATT

Contributing Editor

**T**HIS transition elbow, submitted by an Indiana reader, is somewhat unusual because of the twist of the two openings.

First draw the throat of the elevation view, Figure 1, with the 8-inch radius as shown and then draw the base line  $n-g$  to dimensions. Draw the perpendicular line  $a-h$  and construct the half profile. Next locate the center,  $t$ , and strike the arc  $h$  to  $n$ . Now draw the curved lines from  $x$  to  $n$  and  $x$  to  $g$ . Divide the two arcs  $h-i-j-k$ , etc., and  $a-b-c-d$ , etc., into six equal spaces, and letter and number as shown.

Next draw lines connecting points  $i$  and  $b$  and  $j$  and  $c$ , and  $k$  and  $d$ , etc. Number the points of intersection of these lines with the curves connecting  $x-n$  and  $x-g$  as shown by the numbers 2 and 3, 3 and 4, etc. Now connect all points on the elevation view, with the fine straight lines.

Draw the plan view of the lower opening  $n-g$  and  $n'-g'$ . Drop a line from  $a$  in the elevation view, intersecting the center line  $X-Y$  at  $a'$  and step off the distance  $x$  to  $x'$  found on the elevation view each side of the center line. Now connect the points  $x-n$ ,  $x-g$  and  $a-n$  and  $a-g$  as shown in the plan. Next locate and number the points on the plan view by dropping lines from the elevation view. It is important that these points be accurately located. Five patterns are needed in this problem  $A$ ,  $B$ ,  $C$ ,  $D$  and  $E$  with 2 pieces each of pattern  $A$ ,  $B$ , and  $C$ .

We will first develop pattern  $D$ , Fig. 1. Draw the center line  $a-g$  of an indefinite length and upon this line step off the distances  $a$  to  $b$ ,  $b$  to  $c$ ,  $c$  to  $d$ , etc. found on the throat of the elevation view. Now through these points draw horizontal lines of indefinite length. Next take the distance  $b'$  to  $b$  found on

the plan view and step it off from  $b$  locating  $b'$  on the pattern. Now take the distance  $c'$  to  $c$ ,  $d'$  to  $d$ , etc. with the other points and through these points draw the curved lines  $a-g'$ , thus completing the pattern for part  $D$ .

We will now develop the pattern for part  $E$ . This is done exactly the same as pattern  $D$ . Draw the center line  $h-g$  an indefinite length and upon this line step off and number the distances  $h$  to  $i$ ,  $i$  to  $j$ ,  $j$  to  $k$ , etc. found on the elevation view. Through these points draw lines of indefinite length. Take the distances  $i$  to  $i'$ ,  $j$  to  $j'$ , etc. from the plan view and step these off on the horizontal lines just drawn thus locating  $i'$ ,  $j'$ ,  $k'$ ,  $l'$ , etc. as was done with pattern  $D$ . Draw the curved lines completing the pattern for  $E$ .

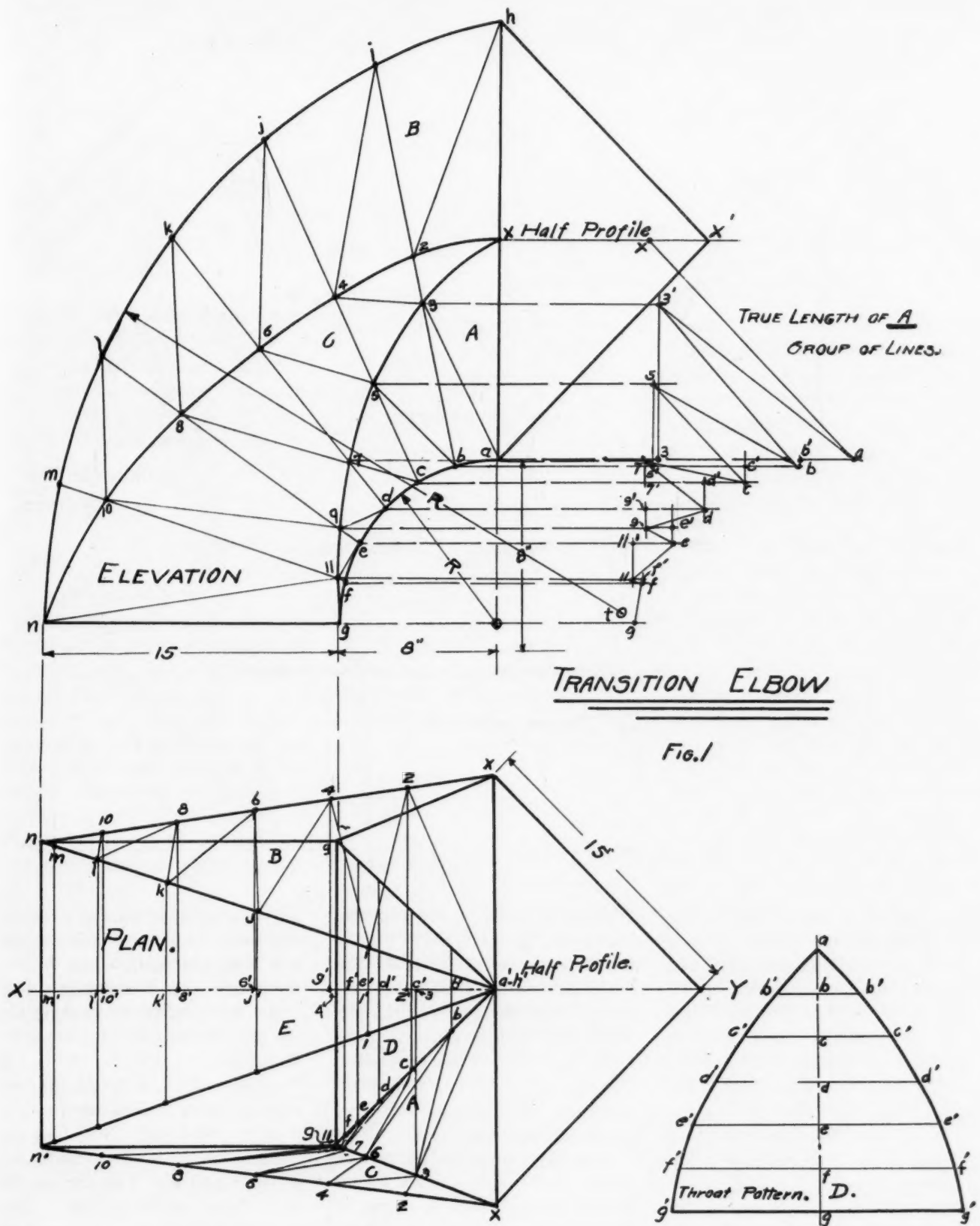
It is now necessary to find the true length of the line  $x$ , 2, 4, 6, 8, 10,  $n$  and the line  $x$ , 3, 5, 7, 9, 11,  $g$  seen on the elevation view. Draw the line  $m-o$ , figure 3 and upon this line step off and number the distances  $x$  to 2, 2 to 4, etc. found on the elevation view. Erect perpendicular lines from each of the points on  $m-o$  and upon these lines step off the vertical distance 2 to 2', 4 to 4', 6 to 6' found on the plan. Then connect these points. These distances are of course the true distances between like points on the elevation view. Now draw the horizontal line  $o-m$  and upon this line step off the distances  $x$  to 3, 3 to 5, 5 to 7, etc. found on the elevation view. Erect perpendicular lines as was done before and upon these lines step off the distances  $x$  to  $a$ , 3 to 3', etc. The other perpendicular lines have been omitted to

avoid confusion. After the points are all located they are connected by straight lines. These are the true distances between like points found on the elevation view.

Parts  $A$ ,  $B$ , and  $C$  must be developed by triangulation. To find the true length of the lines in part  $A$  draw a horizontal line from points  $a$  and  $x$  on the elevation view. Let any point on the line  $x$  be point  $x$  and with the distance  $h-x$  on the profile as a radius and  $x$  as a center strike an arc intersecting the line from  $a$  at point  $a$  and connect these lines to begin the true length lines, Group  $A$ . Next take the distance  $a$  to 3 from the plan and step it off to the left of point  $a$  thus locating point 3 on the horizontal line drawn from  $a$  on the elevation view. Erect a perpendicular line from this point and draw a horizontal line from point 3 in the elevation, intersecting the vertical line at 3'. Now connect points  $a$  and 3, this being the true length of  $a'$  and 3 found on the plan.

Next take the distance 3 to  $b$  found on the plan view and step it off from point 3 on the horizontal line drawn from  $a$  on the elevation view thus locating  $b'$  and drop a line of indefinite length. Now draw a horizontal line from  $b$  on the elevation intersecting the line just drawn locating point  $b$  and connect this point with point 3'. Now take the distance  $b$  to 5 found on the plan and step it off on the same horizontal line locating 5' and erect a perpendicular line from this point intersecting a horizontal line drawn from point 5 on the elevation view.

Connect points 5 and  $b$  as shown. Now take the distance 5 to  $c$  found on the plan and step it off from 5' locating  $c'$  and drop a line from  $c'$  intersecting the horizontal line from  $c$  in the elevation view locating



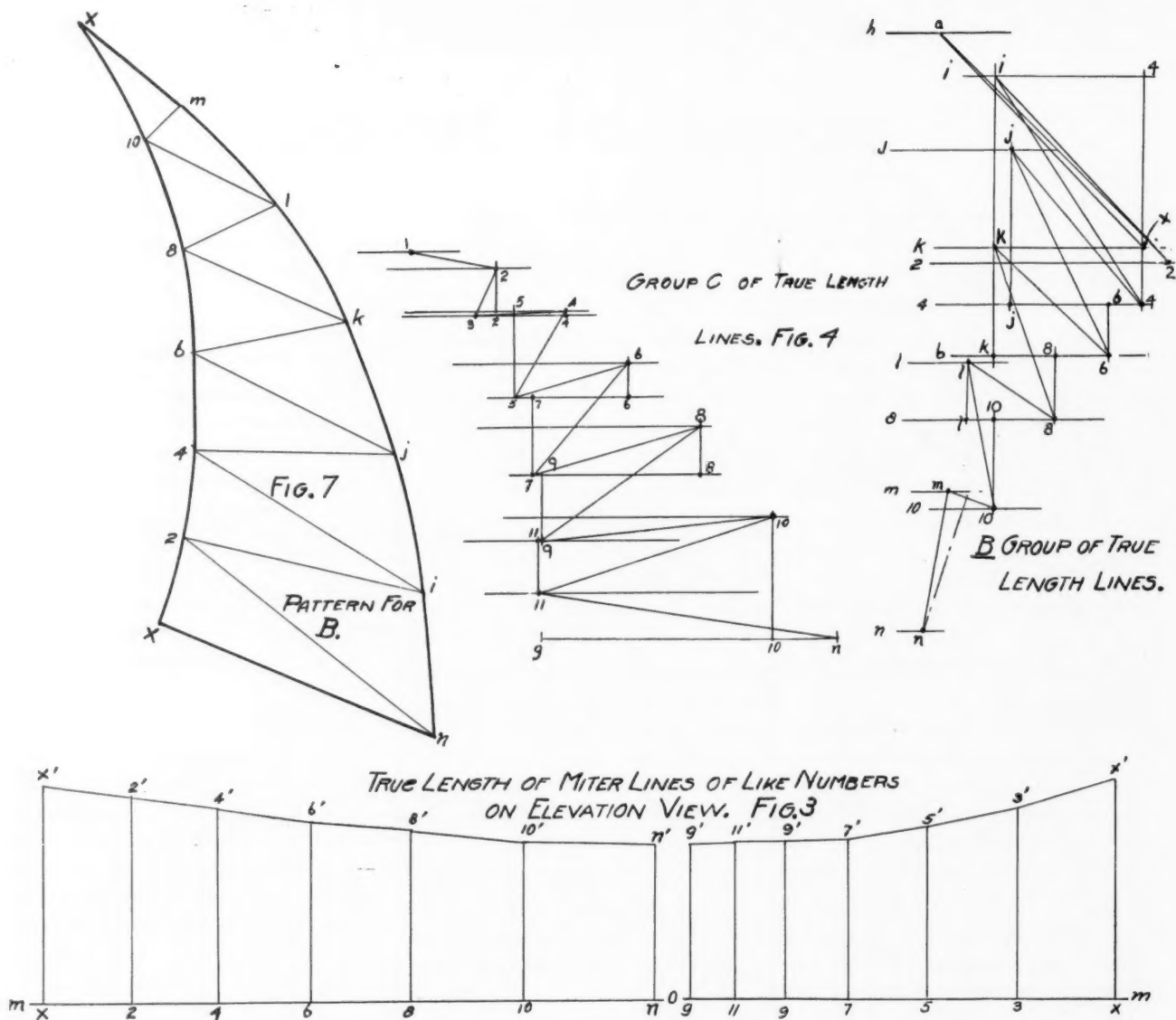
point c. Connect this point with point 5. Step off the distance c to 7 found on the plan as before, locating 7' and draw a perpendicular line intersecting the line from point 7 in the elevation view and locating point 7. Connect this point with point c.

Next step off the distance d to 7 from point 7' locating d' and drop a line intersecting the horizontal line from d on the elevation view and locating d. Connect points 7 and d.

Now step off the distance d to 9 found on the plan on the horizontal line from d and locating 9'. Drop a

line from this point intersecting the horizontal line from point 9 on the elevation view and locating point 9. Next step off the distance 9 to e found on the plan on the line from 9 locating point e' and drop a line from e' intersecting the horizontal line from e on the elevation locat-





ing point *e*. Connect points *9* and *e*. Next take the distance from *e* to *11* on the plan and step off this distance from point *e* locating *11'* and from this point drop a line intersecting the horizontal line from point *11* on the elevation thus locating point *11*. Now draw a line connecting *e* and *11*.

Next take the distance *11* to *f* found on the plan and step it off from *11* locating *f'*. Drop a line from this point intersecting the horizontal line from point *f* found on the elevation locating point *f*. Connect *f* and *11*. Now drop a line from point *11* so as to intersect the horizontal line from *g* on the elevation view thus locating point *g*. Then connect *f* and *g*, thus completing group *A* of true length lines.

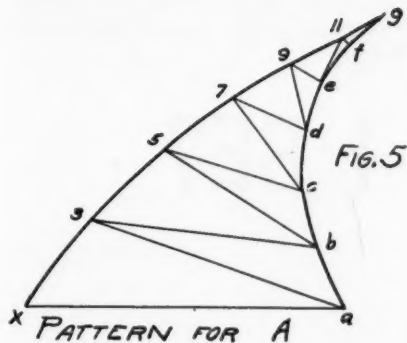
Groups *B* and *C*, figure 4 of true length lines are obtained in exactly the same manner as group *A*. The horizontal lines for these groups are drawn from like points in the elevation view and the other distances taken from the plan view as before. We believe no difficulty will be encountered in obtaining the true length of these lines.

Now develop pattern for part *A*. Start with the line *a-x* figure 5 equal to *a-x* from Group *A*, figure 1. Next with the distance *a* to *3* Group *A* as a radius and *a* figure 5 as a center strike an arc of indefinite length. Now take the distance *x'* to *3'* figure 3 as a radius, and with *x*, figure 5, as a center, strike an arc intersecting the arc previously drawn locating point *3* on pattern for *A*. Next take the distance *3* to

*b* from *A* group of lines as a radius, and with *3* as a center strike an arc and from pattern *D*, figure 1, take the distance *a* to *b'* and with *a* as a center strike an arc intersecting the arc just drawn, locating point *b* on the pattern.

As the pattern is developed, connect the points by lines from *x* to *a*, *a* to *3*, *3* to *b*, etc. Now take the distance from *b* to *5* found on group *A* and with *b* on the pattern as a center strike an arc. Then take the distance *3* to *5'* found on figure 3 and with *3* on the pattern as a center strike an arc intersecting the arc just drawn, locating point *5*.

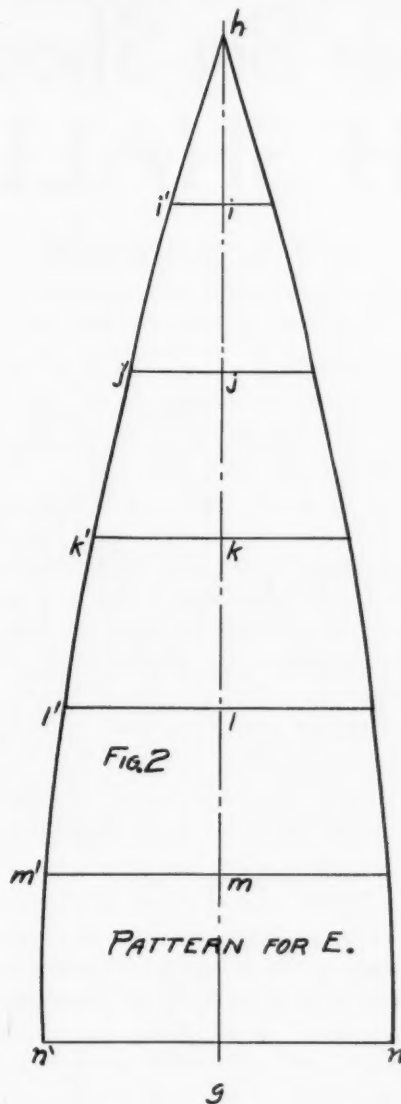
Take the distance *5* to *c* from group *A* and with *5* as a center strike an arc. Next take the distance *b'* to *c'* from pattern *D* and with *b* as a center strike an arc in-



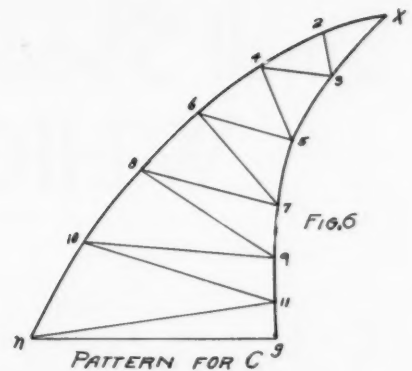
intersecting the arc just drawn locating point *c* on the pattern. Connect points *5* and *c*. Take the distance *c* to *7* found on the Group *A* and with *c* as a center strike an arc and from figure 3 take the distance from *5'* to *7'* and with *5* on the pattern as a center strike an arc intersecting the arc just drawn, locating point *7*. Now take the distance *7* to *d* found on Group *A*, figure 1, and with *7* on the pattern strike an arc as before.

From pattern *D* take the distance *c'* to *d'* and with *c* on the pattern as a center strike an arc intersecting the arc just drawn locating point *d* on the pattern. Next take the distance *d* to *9* from Group *A* and with *d* as a center strike an arc as before. Again take the distance *7'* to *9'* from figure 3 and with *7* on the pattern as a center strike an arc intersecting the arc just drawn, locating point *9*.

Now from Group *A* take the distance *9* to *e* and with *9* on the pattern as a center strike an arc, and with the distance *d'* to *e'* on pattern *D*, and *d* on the pattern as a center strike an arc intersecting the arc just drawn locating point *e*. Next take the distance *e* to *11* found on



Group *A* and with *e* on the pattern strike an arc. From figure 3 take the distance *9'* to *11'* and with *9* as a center strike an arc intersecting the arc just drawn locating point *11* on the pattern. Now take the distance *11* to *f* found on Group *A* and with *11* on the pattern as a center strike an arc and then take the dis-



tance *e'-f'* from the pattern *D* and with *e* on the pattern as a center strike an arc locating point *f*. Now take the distance *f* to *g* from Group *A* and with *f* on the pattern as a center strike an arc. Then take the distance from *11'* to *g'* on figure 3 and strike an arc locating *g* on the pattern.

The same method of procedure is used for figure 6 and figure 7. First develop figure 7 using the true length lines from the *B* group of true length lines. Then take the distances *h* to *i'*, *i'* to *j'*, *j'* to *k'*, etc. from pattern for *E* and use on spaces *n-i*, *i-j*, *j* to *k*, etc. of the pattern, and use the distances *x'-2'*, *2'-4'*, *4'-6'*, etc., from like number on figure 3 to locate *x-2*, *2-4* etc., on pattern *B*.

Now to develop the pattern for part *C*, figure 6, the true lengths are taken from Group *C* of true length lines figure 4, and the distances *x*, *2*, *4*, *6*, *8* and *x*, *3*, *5*, *7*, *9* are taken from like numbered spaces on figure 7 and figure 5.

Extreme care is necessary in developing these patterns.

No allowances have been made for seams.

Patterns will be developed for subscribers by our two pattern editors. In submitting pattern problems be sure that all dimensions are given, that the purpose of the item is explained, that all unusual conditions to be met are clearly outlined and that a sketch accompanies your letter. The right is reserved to publish these patterns.

# Small Shop or Big Shop— WHICH SHALL I BE?

## Dealer's Best Plan

**T**HE best plan is to decide on a definite line of equipment and stay with this, unless something materially better comes along and his supply-house is unable to equip it. Frequent changes of one's line of equipment destroys confidence in your potential purchaser field; and what is of almost equal importance, in yourself, is to choose a desirable tie-up and stay with it.

To my mind, the revamp and modernization field is the most fertile of all. What a source of satisfaction to tear apart an obsolete or poorly designed heating system and rebuild it to meet modern requirements. Competition is practically eliminated; as most engineers seem to differ. Hence, the prospect cannot talk "price" to you; and you should make your price fair and adequate.

You are really doing the customer a favor by revamping his heating system for him. It improves his home conditions and enables him to enjoy life more. Aside from the fact that this is our way of earning a livelihood, there is a real satisfaction in doing a good job well.

When a job is modernized, the customer realizes by comparison with his previous system, that he is getting a real value; and how much better the corrected job really is. The customer is not able to make such a comparison with a new installation, as he does not have the opportunity of comparing this with a former plant; unless this be a complete replacement job. If you can definitely improve results from a customer's existing plant by means of revamping or modernizing it, you have won a friend who will not only bring you future business, but will send you more prospects.

The heating system should be

## By B. L. SCHWARTZ

Address at National Warm Air  
Heating Ass'n Meeting

planned with consideration of the fact that the woman in the home lives with it practically all the time; whereas, the husband is just a "visitor." Hence, neat, inconspicuous registers should be used and stressed in the sales presentation. Likewise, cleanliness of the system. Mention should be made of how much longer the curtains will remain up with the proposed system. How the length of time between house cleanings is lengthened because of the system. This thought will go over big with the housewife.

## Finishing Touches

Stress the importance to your men for the necessity of being neat and orderly in their personal appearance. Men should not go to work with a growth of whiskers on their faces. Your workmen are just as much representative of your organization as you; and they must be made to understand this.

See that the job is finished with all the little touches that distinguish between just a furnace job and a carefully installed heating system. Make sure that the asbestos covering, if this be used on the pipes, is neatly applied and that no spots are left bare. Be sure the men clean up the basement before they leave. Sweep the floor and remove all debris. If the cellar was dirty before the job was started, clean it up before your men leave. This little touch will be spoken of often by the owner long after the job is completed.

Where the basement height permits, use a flat top hood and take the ducts or pipes off the top. This permits much more headroom than side outlets. If galvanized iron be used for the ducts and no asbestos

covering is specified, paint the duct work a neat gray or green. You'll be surprised at the difference in appearance this makes. Don't use a spray gun. Paint can be applied by brush faster and without the attendant side smears which a spray causes.

## Advertising

Unless the dealer is prepared to spend a great deal of money for advertising and has set up a followup organization, all advertising expenditures should be carefully considered beforehand. Spasmodic advertising, whether this be newspaper, billboard, radio or mailing campaign, is of little value. Advertising to be effective must be continuous and consistent, and will bring results. The dealer must, however, be prepared with an adequate followup organization to take advantage of all inquiries. The average small dealer has neither the money nor the organization to go into advertising of any magnitude.

We have secured satisfactory results by running an attractive advertisement in the classified section of the local telephone directory. Some inquiries emanate from this. Most of our inquiries though come to us from satisfied customers. We go a long way to keep them in that category, as their good will is often responsible for the making or breaking of future sales.

## Photographs of Jobs

Another little stunt we often use is to have photographs taken of the heating system after the installation is completed. We then send copies to the owner with our compliments. The owner is invariably so pleased that he goes out of his way to show these photos to his friends; and of course boasts about the system to them.



We try to make our jobs look so nice that the owners often ask their friends to come down to the basement to see the heating plant. And these boosts help.

Before air conditioning reached the stage that it now has, right, satisfactory and good-looking installations were the exception rather than the rule. Hence, photos of attempts of air conditioning installations were not particularly impressive. Now, thanks to the fine air conditioning equipment which is now on the market, an installation of this nature can be made very attractive in appearance. Many of the jobs we have installed have converted their basements into additional living quarters; something that could not have been done with the old-fashioned plants. Hence, we have handed to us another opportunity for passing on, by means of photographs, this new development for consideration for prospective purchasers.

#### Service

"Service with a smile" might well be termed one of our regulations. We never pass the buck and seldom charge for service; even if the customer is at fault. We feel that this little courtesy unconsciously places the customer under obligation to us, and he'll tip us off whenever a prospect comes to his attention as a means of repayment for this service.

#### New Developments

In conclusion, let me add a word of warning not to become too enthusiastic about every new development brought out by the manufacturers. Analyze the principle in back of the article—have an open mind in your comparisons.

For instance, a brand new air washer using the principle of cooling by cold water sprays may defeat its own purpose by saturating the air. A so-called gas saving apparatus assumes that this purpose is

accomplished by throttling the gas flow through the device; hence, less gas passes through the line. A further saving could be accomplished by putting a globe valve in the line and shutting the gas off entirely!

A number of leading manufacturers are now designing their air conditioning units without provision to prevent short circuiting of air around the blower. Unless the overall resistance of the system is low, such assemblies cannot give satisfactory results.

However, if you faithfully learn all that you can about your line of endeavor, few mistakes will be made along these lines.

I honestly believe that there is opportunity galore for successful dealer activities. The warm air heating man of today has a number of inviting fields to choose from, if he cares to specialize exclusively in one. If he sees fit to be a good, all around, general warm air heating dealer and contractor, he should engage actively in the established phases of our business; namely, gravity warm air heating, air conditioning, re-vamp and modernization work, etc.

#### Conclusions

The fact that we have gone through two and one-half years of industrial depression, should not have any bearing on future activities. There are still millions of wage earners whose salaries have not been cut; and who are steadily employed. There are also, millions of wage earners whose salaries have been reduced; but the cost of living and all merchandise have been reduced even more so; so that their comparative earning capacity is at least as great, if not greater than before.

It is unfortunate that many of these people have assumed an attitude of retrenchment. There is no reason why this should be so. I am reminded of a story of two elderly maidens who were approached by a

heating engineer with a proposal for the installation of an air conditioning system. The story was nicely presented and the impression properly created. At the last moment, however, one of the ladies remarked: "Oh, it's too bad that these hard times come during the depression; we'd better not spend any money now." Whereupon the resourceful dealer remarked: "Why don't you know—the depression was over the 15th of last month." "Is that so," replied the prospect; "in that event, go ahead and put the job in."

#### Be Optimistic

Now this story may be imaginative, but it nevertheless, illustrates the point which I am trying to get over to you. Stop singing the blues and talking about the depression. Let us, instead, talk about big industrial developments that are planned and which have been started. Let us talk about industrial activities and good times which we are beginning to participate in. In other words, let us be optimistic and spread optimism wherever we go. You will find that such thoughts will not only help general business conditions, but will actually have a very decided beneficial effect upon you individually.

It is quite possible to talk oneself into almost any state of mind; and the public up to now has talked itself into a state of depression and despondency. If we all pull together and help advertise the fact that this United States of ours has been through conditions lots worse than the one we are emerging from, and that we are headed towards the best ten years that this country has ever had in its history, I feel sure that things will be on the up-grade for us all.

Let us then once more repeat: there is opportunity galore for successful dealer activities. Let us get out and work in order to take advantage of these opportunities; and I feel that success cannot be denied.

▲ This concludes Mr. Schwartz's address. We believe that there is a wealth of practical information in this address given by a man whose business is proof that his ideas are applicable. ▲

# New PRODUCTS

## The Henry Brown Furnace Cleaner

Developed especially for furnace cleaning work and offered in a new low price field, the Henry Brown furnace cleaner is being manufactured by The Electric Vacuum Cleaner Co., manufacturers of the Premier Duplex cleaners. The sales of this equipment are being handled by Henry M. Brown, Jr., of Asheville, N. C. Mr. Brown is the distributor for the United States. Henry Brown is a pioneer of furnace cleaning and has done much to promote its development. With this new equipment and at the very low price at which it is offered Henry Brown feels that more and more interests are going to go into the business of cleaning furnaces.



This equipment offers some excellent features. One man is all that is required to carry or operate the cleaner. The machine comes complete with all tools and accessories that are needed to properly clean all types of heating equipment. The motor is of the ball bearing type and never requires lubrication.

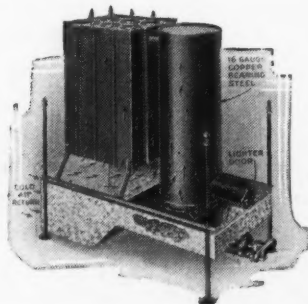
The Henry Brown Furnace Cleaner was first shown in Louisville, Ky., at The National Retail Coal Merchants Association. Its reception was very good and those who saw it were impressed with its simplicity and ruggedness.

Literature may be secured from Mr. Brown at Asheville, N. C., no street address required.

## Security Basement Unit Heater

A new basement unit gas-burning heater designed for either manufactured or natural gas, and adaptable for either gravity or fan operation has been placed on the market by Security Stove and Manufacturing Co., 17th and Oakland streets, Kansas City, Missouri.

This heater can be placed anywhere in the basement where it can be vented either on the floor or suspended. The casing is made to attach side, end or top leader pipes rather than a pipeless register. The burner is placed in the bottom of a drum, while the radiator is rectangular in shape and of the open tube type.



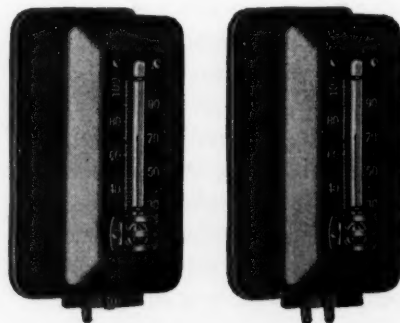
The heater is designed for automatic control of the burner from a thermostat and for fan operation.

The heater is being manufactured in three sizes of the following output capacities—26,350, 41,250, and 63,750 B. t. u. per hour.

A leaflet describing and showing details of the unit has been prepared and will be mailed to any contractor requesting a copy. Prices and sizes are also contained in this leaflet.

## New Sheer Thermostats

The H. M. Sheer Company, Quincy, Illinois, announces several new additions to their line of temperature control products. Two of these new units of interest



to heating men are the Type P-3 Plain Room thermostat and the DN-3 Day and Night thermostat.

The P-3 Room thermostat has been designed primarily for use as a room thermostat along with the Sheer 31-A Gas Valve with Transformer.

The thermostat may be adjusted to maintain a desired temperature at any point between 40 degrees and 90 degrees Fahrenheit.

The Dual Reaction is directed against the tendency of temperature overrun on room temperature.

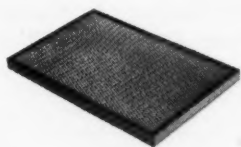
When the temperature in the room is approaching a *high* set temperature the current flowing through the bimetallic coil adds heat to the coil, resulting in a responsive action becoming effective sooner than with the ordinary type of thermostat. The circuit opens and closes several times, thus partly checking the heating plant so that when the desired room temperature is finally reached the last heating action takes place slowly, thus snubbing the tendency toward temperature over-run upward.

When the temperature in the room is approaching a *low* set temperature there are similar advantages. Due to the fact that no current is flowing through the bimetallic coil, the magnetic action closes the circuit several times before the desired room temperature is reached; in this way the last temperature reducing action takes place slowly, thus snubbing the tendency toward temperature over-run downward.

## New Kleenaire Filter Unit

The Kleenaire Filter Company, Stevens Point, Wisconsin, announce a new moderately priced filter.

The new filter has been brought out to meet the demand for a moderately priced dry filter of the permanent type. It is especially adapted for unit air conditioners, unit heaters or for blower manufacturers' standard equipment. There are



no refills to buy, no oil to use, and this filter can be cleaned by washing, tapping, or vacuum. The filter media is a hairlike springy material with low resistance to air flow, and great affinity for dust.

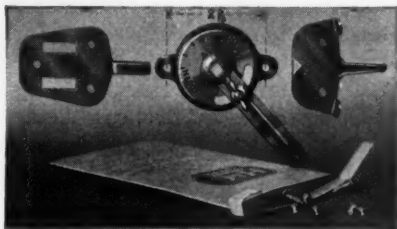
The filter comes in an all metal case, with expanded metal front and rear. List price is \$2.80 per unit with liberal discounts. Filter is sturdy, cannot bulge or warp out of shape.

Literature on the new unit will be ready within a few days and can be secured from the manufacturer.

## Hart & Cooley Regulator

The Hart and Cooley Manufacturing Co., 61 West Kinzie St., Chicago, announces a new dial damper regulator set (Number 74 $\frac{1}{4}$ ) to be used for control of air flow and volume in ducts.

The regulator set consists of a marked dial, handle, damper blade and bearings and all the necessary fittings and screws. The dial is small in size—just over 2 inches—and is marked "open" and "closed" for convenience. The damper is set with a butterfly nut working through the handle.



Two bearings are used to provide rigid support and permanent set for the blade. The complete damper set is supplied in a neatly prepared carton which insures the contractor receiving all parts.

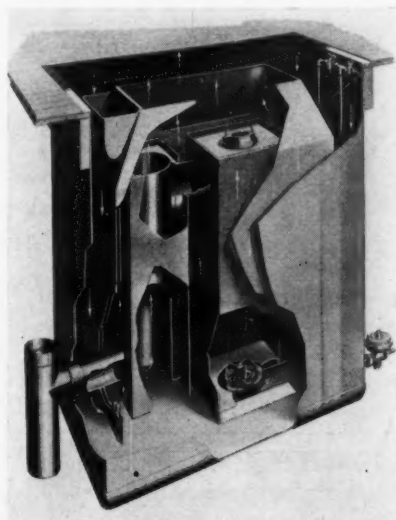
The handle and the dial are cadmium plated for appearance.

Details and literature on the unit may be secured by writing the company.

## Coleman Gas Floor Furnace

The Coleman Lamp and Stove Company, Wichita, Kansas, manufacturers of gasoline burning devices for more than 30 years, announce rapid production of their Models 10 and 11 gas floor furnace. The units have been under test for an extended period.

Among the features claimed for the unit are—a removable register which permits an 82 percent flow of air, an air insulated inner jacket insuring cool outer casing and heat conservation, handy valve controls, a pressure gas regulator which insures even gas flow, a chimney draft diverter, and a removable humidifier.



A patented Bunsen type burner is used and is equipped with a blue flame pilot. A flue type radiator, in addition to the heat conserving combustion chamber insures economy of operation and assists in providing a smooth, even flow of warm air.

The company has prepared a set of test data sheets showing their unit's operating efficiency and capacity as compared with similar units. Copies of descriptive literature and of these test sheets may be secured by writing the company.

## New Milcor Products

A new counter-flashing receiver made in eight-foot lengths with faces of the sheet thickly bossed and the sheet formed to give immediate application in masonry is announced by Milcor Steel Company, Milwaukee. Because of the construction the receiver is asserted to bond thoroughly with the mortar and prevent moisture penetration. After the flashing sheet is inserted in the receiver fold, the outer edges of the receiver are pounded against the wall to seal the flashing.

Another interesting item just added to the Milcor line is the Ideal Nailing Strip which can be used in concrete, brick or

stone work. The strip consists of a bossed and folded sheet shaped like a T with an open and continuous slot in the center. The strip is furnished in all kinds of metal and is placed in the wall when it is being laid up. Nails for the nailing strip are then driven into the slot.

The company has also issued an elaborate and very interesting booklet showing the line of metal bases for plaster, window trim, stools and expansion wings.

Literature on the first two items and the booklet can be secured from the company.

## Bishop and Babcock Furnace Blower

The Bishop and Babcock Manufacturing Company, 4901 Hamilton Avenue, N. E., Cleveland, Ohio, announces a new furnace blower incorporating advanced design. The company states that such features as quietness and accurate rating and sound construction are taken for granted and that additional features will be stressed.

The blower is furnished in a complete housing unusually compact and containing the wheel, motor, filters, and all essential parts. The motor is rubber mounted and the housing is lined with Celotex.

The housing will be furnished in flaked aluminum paint with the trim in black.



The Celotex has a molded casing of asbestos to increase sound absorption and permanency. Simplified operation is assured by special bearings which require only once a year oiling.

An adjustable speed drive will be standard practice making possible complete coverage of capacities with only four sizes of blowers. Size 10 covers a range 500 to 1,000 C.F.M.—size 12 has 1,000 to 2,000 C.F.M.—size 15 has 2,000 to 3,000 C.F.M.—and size 18 has 3,000 to 4,000 C.F.M.

Complete literature on the units has been prepared and will be sent to any dealer writing the company.



## CAN YOU TELL ME ?

From Thomas Hughes, Chicago, Ill.

Can you tell me where I can secure a liquid solution called "Rusticide" used for both removing rust and polishing metal?

Ans.: Rusticide Company, 5500 Walworth Ave., Cleveland, Ohio.

From Reynolds Mfg. Co., Springfield, Mo.

Will you please advise the name of the company making the "Waco Can Straightener"?

Ans.: Wacho Mfg. Company, Galena and 31st street, Milwaukee, Wis.

From the West Side Hardware Company, Evanston, Ill.

Who in Chicago job the Royal furnace made by Hart & Crouse of Utica?

Ans.: Hart & Crouse Co., 3110 Wentworth Ave., Chicago.

From Otis H. Reed, Danville, Ill.

Can you refer me to manufacturers of self-closing (automatic) louver ventilators to be used in side walls?

Ans.: Ilg Electric Ventilating Co., 2850 North Crawford Ave., Chicago; Arex Company, 330 North Michigan Ave., Chicago; American Foundry & Furnace Co., Bloomington, Ill.

From Interstate Cornice Works, Sioux City, Iowa.

Where can we buy the Stanley flexible rigid steel rules?

Ans.: Stanley Works, New Britain, Conn.

From H. P. McAleer, Chippewa Falls, Wis.

Can you send me a list of concerns in the Middle West where we might obtain slate and tile roofing?

Ans.: Bird & Son, 1472 West 76th St., Chicago; Ludowici Celadon Co., 104 S. Michigan Ave., Chicago; Hawthorne Roofing Tile Co., 5850 Ogden Ave., Chicago; Rising and Nelson Slate Co., 2554 W. Harrison St., Chicago; Logan Long Co., 37 W. Van Buren St., Chicago; Richardson Roofing Tile Co., 122 S. Michigan Ave., Chicago; Structural Slate Co., Pen Argyl, Pa.

From C. H. Myers, Bucyrus, Ohio.

Where can I have round white porcelain insulators made like pattern (one inch in diameter with 1 5/16 inch centre hole; 3/8 inch thick)?

Ans.: Square-D Company, 1144 W. Washington Blvd., Chicago.

Where can I secure No. 22 U. S. standard gage nichrome heating element wire?

Ans.: Driver-Harris Co., 1140 Washington Blvd., Chicago.

Cheyenne Sheet Metal Works, Cheyenne, Wyoming. Can you furnish us with names of manufacturers of 2 1/2 inch corrugated iron?

Ans.: Refer to Buyers' Guide under "Sheets—Black and Galvanized."



# PERFORATED METALS

*for Every Requirement in*

## STEEL, BRASS, BRONZE, COPPER, ZINC, TIN-PLATE, MONEL, LEAD, STAINLESS IRON, ETC.

*Perforated to Your Order*

Round Holes from .020" to 7" — Oblong and Slot Holes from .008" to 3" wide  
Ornamental Patterns—Square Holes of Standard Sizes for

Grain Separating and Grading, Ore Sizing and Screening, Coal Screening and Washing, Pulp and Paper Mills, Sugar Refining, Grilles and Ventilators, Machine and Belt Guards, Irrigation Wells, Drying Floors, Or any other purpose

OUR ENTIRE PLANT IS DEVOTED TO PERFORATING

# THE HARRINGTON & KING PERFORATING CO.

5649 FILLMORE ST., CHICAGO, ILL., U. S. A.

NEW YORK OFFICE, 114 LIBERTY ST.

## News Items . . . . .

### We Beg Your Pardon!

In our May 23 issue we stated that the lead coating of the copper used in the West Virginia State Capitol dome was done by the Wheeling Metal & Mfg. Co. This is incorrect. The copper was furnished by Revere Copper and Brass, Inc., and the stamped copper on the dome was Revere Leadtex.

### Williamson Heater Co., Incorporates

The Williamson Heater Co., 55 E. Goodale street, Columbus, Ohio, which has been operated as a partnership since 1901, was incorporated June 14 under the name of the Williamson-Favret Co.

The company was chartered with a capital set-up of 100 shares of no par value and \$15,000 in preferred stock.

For more than nine years the company has been operated under the management of L. E. Favret. The business under the new name will continue operations at the same address as that used by the partnership organization.

In addition the new firm will add a complete line of equipment for automatic gas heating.

### Edwards Mfg. Co., Buys Hot-Kold

The Edwards Manufacturing Company, Cincinnati, Ohio, has just completed negotiations for the purchase of the good will, patents, manufacturing rights, dies, machinery, etc., of the HOT-KOLD air conditioning system, formerly manufactured by the General Iron Works Company, of Cincinnati, Ohio.

Morris Floyd, who for the past several years has acted as Sales Manager for the General Iron Works Company, will take charge of the newly organized heating department of the Edwards Manufacturing Company.

HOT-KOLD is a gas-fired air conditioning system, with its heat exchanger constructed of heavy Chromium (stainless) steel, and is favorably known to gas companies, heating engineers, architects and the general public. A large number of installations are heating homes in practically every state in the Union.

HOT-KOLD also may be used for house cooling by the installation of dehumidification coils and a compressor manufactured by the Frigidaire Corporation at Dayton, Ohio.

### Lamneck Co., in Operation Pending Sale

The W. E. Lamneck Co., Columbus, Ohio, manufacturers of furnace pipe, stove pipe and registers for warm air furnaces, is being operated by Perl S. Miller, receiver.

Mr. Miller stated that, with the firm in production and maintaining contact with customers the prospects of disposing of the property to the benefit of creditors and at the same time make it valuable to purchasers are increasing.

Recently Judge Hough of Federal Court granted the receiver permission to operate the company and keep it in production. As a result many of the firm's customers have expressed appreciation and placed some nice orders with the firm.

Mr. Miller states that the sale of merchandise will be continued and that in addition to products which had been manufactured before the receivership and being sold under the court order, permission has also been granted to make new articles for sale.

The court recently approved the sale of more than \$25,000 worth of merchandise, which was sold at auction, but turned down a small bid for the assets of the company.

## What Price Air Conditioning?



**W**HATEVER the price of air conditioning, your prospects will benefit most if you install for them the furnace that works at maximum efficiency with minimum cost, the

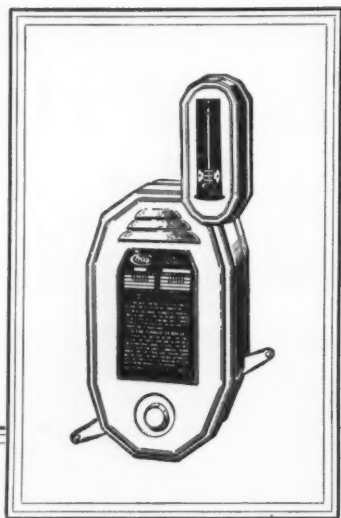
## AKRON AIR BLAST

The AKRON AIR BLAST offers two types—all sizes—Gravity or Single Unit Air Conditioning.

Air Conditioning can be made a source of much profit to you, if you do some aggressive sales work in your community.

1932 demands three times the work to do the same amount of business. Air conditioning will reward he that knows and works.

**The MAY-FIEBEGER Co.**  
**NEWARK - OHIO**



# COOK HEAT CONTROL

for COMFORT, CONVENIENCE, HEALTH,  
SAFETY and FUEL ECONOMY . . .

## QUICK TURNOVER

The available market is a broad one—only three homes in each hundred now have automatic heat control.

The device gives complete customer satisfaction—users are the best salesmen.

## BIG PROFITS

It carries a long margin of profit—sufficient to pay for aggressive selling effort and still allow a liberal net profit.

Cook Heat Control has no complicated mechanisms—no springs, gears, weights, electric motor; nothing to oil,—requires no attention. Guaranteed for two heating seasons.

A time payment plan makes Cook Heat Control easy to sell and relieves the dealer of collection expense.

## DEPENDABILITY

60,000 units giving satisfactory service—listed as standard by the Underwriters' Laboratories—approved by the Anthracite Institute and backed by thirty years of electrical manufacturing experience.

## SELLING FEATURES

**SAFETY FEATURE.** Should the electric current fail, the control unit immediately operates to shut the drafts, bringing the fire under complete control.

**FIRING CLUTCH.** When firing, a button is pushed in, which closes both the check and draft door. The clutch automatically re-engages after three minutes, and is again under control of the thermostat. Nothing to remember—nothing to forget. Cook Heat Control offers you more than any control on the market.

## NEW LOW PRICES

WRITE TODAY FOR OUR COMPLETE SELLING PLAN ON COOK HEAT CONTROL, LIMIT CONTROLS, RELAYS, ELECTRIC CLOCK THERMOSTATS, STOKER CONTROLS, ETC.

**COOK ELECTRIC COMPANY**  
2710 Southport Avenue Chicago, Ill.

## News Items . . . . .

### Organize New Company in Brooklyn

Edward M. Richard, Inc., Brooklyn, has been organized by Edward M. Richard, 271 Forty-fourth Street, and associates to take over and expand sheet metal and tinsmithing works at 2015 Bath Avenue, heretofore operated under name of Edward M. Richard. Mortimer D. Atlas, 1270 East Nineteenth Street, Brooklyn, is interested in new organization.

### G-E Plans Air Conditioning Equipment

Recent press announcements state that General Electric has entered the field of air-conditioning.

"Eventually," said J. J. Donovan, manager of the company's new air conditioning department, "we expect to have a system developed which will heat and humidify the air of the home in the winter, cool and dehumidify it in the summer, and provide air circulation and purification the year round. We also have under development a gas burner and a coal stoker, as part of the plan to provide complete air conditioning, making use of every type of fuel available.

### F. E. Bissell Recovering

The many friends of F. E. Bissell, president of the National Super Service Company, Toledo, who just a month ago was seriously injured by an automobile while on a business trip to Chicago, will be happy to learn that he is now well on the road to recovery.

Mr. Bissell will probably be discharged within the next ten days from the Evanston Hospital at Evanston, Illinois.

### George F. Unbehaun Joins Forest City

George F. Unbehaun, formerly of the Fox Furnace Company is now representing the Forest City Foundries Company of Cleveland, Ohio.

His territory will be the state of Ohio.

### Josiah Brick Borden, Pioneer, Dies

Josiah Brick Borden, founder of the Borden Stove Company, died June 23 after a long illness in his home at 5037 Hazel Ave., Philadelphia. He was 72 years old.

Mr. Borden was born in Woodstown, N. J., coming to Philadelphia in 1878, when he established the stove manufacturing business with his brother, the late F. M. Borden. He was also an organizer of the United Stove Repair Company.

Mr. Borden was a member of numerous fraternal organizations and clubs.

Surviving him are his widow, one daughter, Mrs. Arthur Hagan Miller, and a brother, John Borden. Funeral services were held Monday at 1820 Chestnut St., Philadelphia.

### Youngstown Appoints L. E. Wallace New York Manager

Lew E. Wallace, for many years assistant manager of pipe sales, has been appointed New York manager in charge of sales by the Youngstown Sheet and Tube Co., Youngstown, Ohio. Mr. Wallace succeeds W. B. Blowers, who becomes special representative in New York.



## News Items . . . . .

### New Williamson Heater Co., Representatives

The Carter, Donlevy Co., 1736 Frankford Ave., Philadelphia, announce that they have been selected by the Williamson Heater Company, Cincinnati, as direct distributors from their Philadelphia warehouse of the entire Williamson line of furnaces, fittings, air conditioning units, blowers, furnace parts and accessories.

Warehouse space will be allotted and an engineer will be available for plan service.

### Canadian Company to Control Lennox Canadian Sales

The Lennox Furnace Company, Marshalltown, Iowa, and Syracuse, N. Y., announces that because of import duties which make the sale of their furnaces unprofitable in Canada, a controlling interest in the Canadian sales company has been sold to a group of prominent Canadian business men. A plant for the manufacture of furnaces will be established at St. Catharines, Ontario.

L. L. Anthes of Toronto, president of the Anthes Foundry Company, Ltd., of Toronto, Winnipeg and Vancouver and at one time president of the American Foundryman's Association will be president of the new company. The name, Lennox Furnace Company of Canada, Ltd., will be retained.

### Warm Air Furnace Fan Equipment Adopted by Superfex

The Warm Air Furnace Fan Company, 6545 Carnegie Ave., Cleveland, Ohio, announces that their equipment has been adopted by the Perfection Stove Company for their low priced air conditioning unit.

This unit, known as the "Superfex," consists of an oil burning furnace especially designed for a balanced furnace, oil burner and controls. The conditioning apparatus consists of Miles three-speed centrifugal fan with louvers, two horizontal sections of dry filters, a bonnet stat for the fan and a manual, three-speed switch for increased fan speeds.

Literature on the unit can be secured from the Perfection Stove Company, 7609 Platt Ave., Cleveland, Ohio.

### Carrier Demonstrates Store Air Conditioning

On March 23, the Carrier Engineering Corporation gave a demonstration of air conditioning equipment for small stores at its research laboratories at Newark, N. J. The exhibition was presented in a model store, 55 ft. by 20 ft. by 13 ft., which had been erected for the purpose of testing the apparatus.

Surrounding the model store was a shed in which weather duplicating the hottest and most sultry day of summer could be artificially reproduced. At the time of the demonstration, a temperature of 96° F. was maintained in the shed, and the temperature recorded within the store was 72°.

A unique feature demonstrated in the test was a device for preventing loss of cooling and dehumidifying effect when the store door was opened. This consisted of an outlet across the top of the door opening through which recirculated air from the room was discharged at high velocity, thus forming a screen preventing the entrance of the warm, humid air from outside.

## "I got the Jones Contract!"



"Boy, am I getting the breaks now! Last month that big Brown contract, and now this. But believe me, we deserve 'em! If I do say so myself, our shop is turning out the highest class work you could find anywhere. It's great to be able to keep the boys working steady, too!"

You can take it from the contractors who know from experience—using Kester Solder is a couple of good long strides in the direction of profit and success.

Kester Solder is pure—made of virgin metals. It will never break down. It does a *permanent* perfect job. What's more, Kester is quicker and easier. The flux is self-contained, and your helpers like to work with it. They can cut soldering time by a third, and do a bang-up job always, with Kester. The big bids come your way, and you can keep your men busy all year around!

Your jobber sells Kester Acid-Core, Rosin-Core, Paste-Core Solder on 1, 5, and 20 lb. spools. Write for information.

#### KESTER SOLDER COMPANY

4241 Wrightwood Avenue, Chicago, Illinois

Eastern Plant, Newark, New Jersey

Canada, Kester Solder Company of Canada, Ltd., Brantford

### HELP UNEMPLOYMENT

by purchasing U. S. products made by U. S. labor  
**KESTER SOLDER IS 100% AMERICAN**

**KESTER**  
FLUX-CORE  
**SOLDER**  
Acid-Core • Paste-Core • Rosin-Core

easy to use

MARSHALLTOWN



SHEARS



No. 18

## SPECIFICATIONS

## CAPACITY—

18 gauge and lighter— $1\frac{3}{4}$ " radius.

## CUTTERS—

2"x $1\frac{1}{2}$ "—high grade tool steel. Slightly knurled to feed material.

## ADJUSTMENT—

One bolt. Instructions furnished.

## SIZE AND MATERIAL—

Height  $19\frac{1}{2}$ " ; head cast iron; base cast iron; gears steel and cast iron. Shipping weight 45 lbs.

SHEARS  
THAT CUT

That's what you're looking for—shears that will save money for you—shears that stand the gaff.

Install at least one type of Marshalltown throatless shears in your shop. Do it now!

**SHEARS FOR EVERY JOB: CUTTING CAPACITY UP TO  $\frac{1}{2}$ ".**

The MARSHALLTOWN line is complete—a shear for every use.

THE CATALOGUE TELLS THE STORY—WRITE FOR IT

MARSHALLTOWN MFG. CO. MARSHALLTOWN IOWA

## MONEL METAL JOBS

## BUILD

## PROFITABLE BUSINESS

● Demand for Monel Metal equipment is constantly growing. In every community there are homes, schools, restaurants or factories offering a good market for many different kinds of Monel Metal jobs.

Hundreds of sheet metal firms are making money on Monel Metal equipment...and there's no reason why you should not do the same. Read the experiences of the successful firms featured in our "True Talks" series which appears regularly in this magazine...also write us for helpful sales literature.

THE INTERNATIONAL NICKEL COMPANY, INC.  
67 WALL STREET, NEW YORK, N. Y.



Monel Metal is a registered trade mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

## New Literature . . .

## Zinc Worker's Manual Now Free

Sheet metal contractors will be interested in knowing that the Zinc Worker's Manual, originally priced at \$1.50, will now be given free to any contractor not possessing a copy in his files.

This manual, first published in 1929, is one of the most comprehensive works of its kind in the metal working field. There are some 112 pages in the book with practically every page profusely illustrated with excellent drawings showing details of the processes and applications discussed. In general outline, the book is designed to present a thorough and up-to-date discussion of zinc and its application.

Chapters are devoted to the design, service and application of all types of batten roofing, standing seam and flat roofing, zinc shingles, leaders and gutters, valleys and flashings and corrugated sheet. Complete discussion is presented on how to apply zinc to compensate for expansion and contraction and for the characteristic lack of tensile strength in a zinc sheet. The appendix carries a number of valuable tables on weights, sizes, estimating tables and miscellaneous data.

The book may be secured by writing American Zinc Institute, 60 East 42nd St., New York City.

## New Furblo Air Conditioning Leaflet

A new and elaborate leaflet showing numerous excellent installations of Furblo equipment and tying into the business paper advertising now being run by the company has been published by the Lakeside Company, Hermansville, Mich. Copies of the leaflet can be secured from the company.

The leaflet is designed to emphasize the fact that a million dollars worth of publicity is now being accorded air conditioning and that the aggressive dealer will take advantage of this interest.

All the company's line of blowers, filters and humidifiers are illustrated.

## Gohmann-Kahler Catalogue

A new catalogue and price list showing the latest prices and the complete line of furnaces, cooking ranges and heating stoves has been prepared by the Gohmann-Kahler Corp., New Albany, Indiana. Copies of the literature can be secured from the company.

The catalogue is profusely illustrated in natural colors and is a handsome piece of work.

The furnaces are revamped and modernized patterns of the O. K. Stove and Range Co., formerly of Louisville. The furnace is of the self-cleaning flue type with a fire pot and two piece dome and radiator.

## McIlvaine "Cold 70" Bulletin

McIlvaine Burner Corporation, 749 Custer Ave., Evanston, Ill., have issued a new four-page bulletin which discusses "cold 70." The bulletin explains the meaning of the term and shows by means of two graphs the difference between floor temperatures with intermittent and constant burner operation. The graph lines are plotted against outdoor temperatures and against eye level room thermostat temperatures.

Contractors interested in this phase of heating can get a copy of the bulletin by addressing the McIlvaine company.

## New Literature . . .

### Owens-Illinois Catalogues

"Air Filters," a new catalogue covering in a very comprehensive manner the design and use of the new replacement type cell filter, has been published by the Owens-Illinois Glass Company, Toledo, Ohio.

The catalogue gives complete information on the design, construction and application of this glass wool filter. The properties of the filter are explained and illustrated by charts and photographs. Drawings also give complete information on the use of these cells in series for industrial work. Each combination is also listed for C. F. M. and arrangement.

The company has also published a booklet "Jobs to Do at a Profit," describing the market for filters in gravity installations. The booklet points out the possible sales arguments to be used in selling this idea and gives complete information on suitable metal housings to take various combinations and numbers of filter sections.

Copies of these two booklets can be secured from the Owens-Illinois Glass Company. Address the "Industrial Materials Division."

### National Foundry and Furnace Co., Price List

A new price list and discount sheet, Number 20, has been issued by the National Foundry and Furnace Company, Boller Ave., and B. & O. Railroad, Dayton, Ohio.

The catalogue lists parts for practically all furnaces and boilers now in production or discontinued.

Copies of the catalogue can be obtained from the company.

### Harrington and King Grille Catalogue

The Harrington & King Perforating Co., 5655 Fillmore St., Chicago, and 114 Liberty St., New York City, have just received from their printers their new 1932 catalogue. The catalogue is an elaborate presentation of the company's complete line of grilles.

The pages are profusely illustrated with photographs and drawings and contain, also, tables of sizes, opening dimensions, etc.

Many of the grilles displayed are being shown for the first time, patent rights and applications having been only recently received on these new faces.

Contractors doing fabrication work requiring perforated metal can secure a copy of this valuable booklet by addressing the company at either office.

### Round Oak "Airklenzer" Leaflet

The Round Oak Furnace Company, Dowagiac, Mich., has issued a new, colorful leaflet describing the "Airklenzer" unit. This unit consists of a boiler plate furnace, twin wheel blower, dry filters, automatic humidifier and controls.

The leaflet is designed and written to be used to tell the story of home comfort to the home owner. A sample of the leaflet can be secured by writing the Round Oak Company.

## You Can Get the Business

There are scores of furnaces in your neighborhood that can never see another winter through. They have got to be replaced; and you can have the jobs if you have the wide range of types and sizes to offer comprised in the Moncrief line, with all the features and quality that have made the name of "Moncrief" famous.

You can get prompt service both in furnaces and parts from a distributor located conveniently near you.

The  
**Henry Furnace & Foundry Co.**  
3471 East 49th St. Cleveland, Ohio

Branches at  
Pittsburgh, Pa., and Ashtabula, Ohio

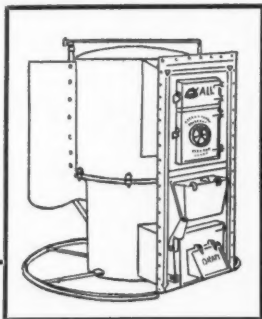
Eastern Office  
2134 Market St., Philadelphia, Pa., E. L. Garner, Mgr.  
Pacific Coast Representative  
McPherson Furnace & Equipment Co., Seattle, Wash.

### Distributors:

Chicago Furnace Supply Co., Chicago, Ill.  
Moncrief Furnace Co., Indianapolis, Ind.  
The F. H. Lawson Co., Cincinnati, Ohio.  
Johnson Furnace Co., Kansas City, Mo.  
E. A. Higgins Co., Omaha, Neb.  
J. M. & L. A. Osborn Co., Buffalo, N. Y.  
and Detroit, Mich.  
Geo. H. Cole Supply Co., Troy, N. Y.  
W. H. Landers Co., Syracuse, N. Y.  
Springfield Plumbing Supply Co., Springfield, Mass.  
Sheet Metal Supply Co., Milwaukee, Wis.  
Northern Metal & Mfg. Co., Green Bay, Wis.  
Schrader-Easley Co., Memphis, Tenn.  
Marshall-Wells Co., Duluth, Minn.  
Rhodes Mfg. Co., Grand Rapids, Mich.  
Moncrief Heating Co., South Bend, Ind.  
Moncrief Heating Co., Youngstown, Ohio.

# MONCRIEF FURNACES





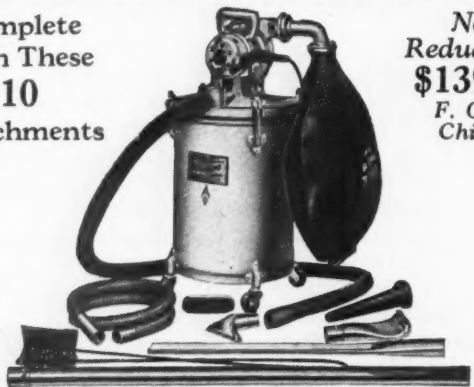
**All Warm Air Furnaces are Good—  
Some are Better than Others—  
The X-L-All is the Best!**

This would be an empty statement unless we could easily back it up—and we stand ready to do this very thing. The radical departure from the customary straight drum design is quickly appreciated by everyone. The advantages of the oversize combustion chamber and increased direct heating surface put it way out in front as a winner. Write today for a copy of the free interesting booklet which will give you all the reasons why this is the line you should have. It's the surest, quickest way to a profitable furnace business.

The  
**Deshler Foundry & Machine Works**  
140-142 South East Ave.      Deshler, Ohio

**Breuer's Ball Bearing  
1932 TORNADO FURNACE CLEANER**

Complete  
With These  
**10**  
Attachments



Now  
Reduced to  
**\$139.50**  
F. O. B.  
Chicago

**WHAT GOOD IS A FURNACE CLEANER  
WITHOUT THE RIGHT TOOLS?**

You must have all of these 10 tools to clean thoroughly all types of warm air furnaces and hot water boilers. \$29.75 worth of extra attachments—that's what you get with a TORNADO Furnace Cleaner at no additional cost! They save approximately one hour on every cleaning job. Think what this means to you in extra profits. Actually a one man outfit—100 per cent portable—weight only 30 pounds—a real, heavy duty commercial cleaner, not a household type as used for carpet cleaning. Far greater vacuum cleaning power—proved by comparison— $\frac{1}{2}$  H.P. G.E. Motor—ball bearing throughout—no oiling. Removes all loose dirt from air system without taking down pipes—an exclusive BLOWER feature of the TORNADO. We invite comparison of the TORNADO point for point—price, portability, weight AND POWER. We will ship the TORNADO on three days' free trial—no obligation—so that you can test our claims. When you purchase a TORNADO you get more than a machine—we supply the advertising and a complete furnace cleaning sales plan free with which to build an attractive business and profit. Most users tell us the TORNADO pays for itself in a few weeks' time. Write today for complete information.

**BREUER ELECTRIC MFG. CO.**  
865 BLACKHAWK STREET      CHICAGO, ILLINOIS

## New Literature . . .

### Payne Orange Coloring Equipment

The Payne Furnace and Supply Co., Inc., 336 North Foot-hill Road, Beverly Hills, Calif., have a new booklet which describes the methods and apparatus used to color, reduce shrinkage, reduce stem dropping, and speed up final preparation of citrus fruit for the market.

Illustrations of typical plants and discussion of the process and results obtained with the company's apparatus are related in detail. Equally interesting is the fact that this same apparatus can be used for ripening bananas, tomatoes and vegetables, and for bleaching celery. Tests show that these processes can be done better at the destination than at the point of production.

Contractors operating in truck garden and fruit sections can get copies of the booklet by writing the company.

### American Air Filter Complete Catalogue

American Air Filter Co., Inc., Louisville, Kentucky, have now completed assembly of a catalogue containing a copy of each of the many booklets published describing the company's extensive line of filters and filtering apparatus.

Among the separate booklets now included in this catalogue are: Air Filters in Industry, Importance of Filtered Air in Buildings, Multi-Panel Air Filter, Unit Type Air Filters, Airmat Filters, Dust Arresters, Cabinet Filters, etc.

The assembled catalogue is a complete treatise on filtering and filter applications with American products.

The company will be glad to send a copy to any contractor who uses or specifies this equipment.

### Peerless Foundry Co., Leaflets

A series of new leaflets describing the 1932 line of products has been prepared by the Peerless Foundry Co., Indianapolis, Ind. These leaflets are modernistic in design and use color elaborately.

One leaflet describes the 1932 steel furnace with a cut-away view and details of construction. Another leaflet describes the Pressure Heat Tubes which the company has devised for accelerating air flow in the casing. A third describes the oil burning furnace. Two smaller leaflets describe and show details of the steel and the cast furnace as improved for 1932.

Copies of all this literature can be obtained from the company.

### U. S. Register Company Leaflet

A new leaflet showing and describing the line of Forced-Air registers has been issued by the United States Register Company, Battle Creek, Mich. Several types of baseboard, flush and convex registers are shown. There is also included a complete list of sizes and prices. Copies of the leaflet can be obtained from the company.

### Milcor Aluminum Skylights

Milcor Steel Co., Milwaukee, Wis., has ready for mailing a leaflet describing their new aluminum skylights. Various drawings show all details of the new items and there is a complete description explaining the salient features. Contractors interested in skylights can secure a copy of the leaflet from the company.

# It's Out!

**THE NEW  
NATIONAL  
REPAIR  
CATALOG**



Complete  
Price List of  
FURNACE  
REPAIRS

Nothing is obsolete with National, whether made in 1880 or 1930 . . . we have it. Send for Catalog Number 20. Lower prices now prevail.

*The*  
**NATIONAL FOUNDRY &  
FURNACE COMPANY**  
1146 Bolander Ave. Dayton, O.

## The Perfect Shear for VENTILATING Work

Right now, is the time when your prospects really think more about ventilating than at any other time in the year.

The time for you to profit by ventilating work then, is NOW. Work out your sales campaign, and go after your prospects. Tell your story and you will find there is ventilating business for the aggressive dealer.

Send for  
Particulars



VIKING SHEAR CO. Erie, Pa.

*The*  
**VIKING**  
*Shear*

And as an added suggestion, include the Viking Shear in your ventilating work. The Viking Shear really backs up our claim of "the perfect shear for ventilating work". Strong, and sturdy, built of only the finest materials, the Viking will accomplish its tasks in the shortest possible time, and incidentally, you always profit on this labor saving.

# INDEPENDENT

## "FABRIKATED"

### COLD AIR FACES

#### "FABRIKATED" FLOOR REGISTERS

### INDEPENDENT REGISTER & MFG. CO.

3741 EAST 93rd STREET .. CLEVELAND, OHIO

**82% OPEN AREA**

**CAN'T BE BEAT**

We have not been content to rest on our reputation as originators of the now famous "Fabrikated" faces. Every feature that would improve their construction and appearance has been added. So that today, Independent "Fabrikated" faces lead in affording the utmost open area, rigidity and fine appearance.

ANY SIZE—ANY FINISH

Send for catalog showing full line of Registers, Faces and Grilles.

THE MOST COMPLETE LINE OF  
AIR CONDITIONING UNITS IN AMERICA

## SILENTAIR

SILENTAIR BLOWER

SILENTAIR-JUNIOR BLOWER

**MATCHED UNITS  
TANDEM & VERTICAL  
COMBINATIONS**

SILENTAIR WASHER

THE success of SILENTAIR AIR CONDITIONING UNITS results in no small measure from the fact that they are MATCHED UNITS — properly designed — fully equipped — guaranteed ratings; easily installed with any warm air furnace. They bring splendid profits to dealers, and comfort and economy to home owners. Write for descriptive literature.

**Built Up to a Standard—Not Down to a Price**  
**A. GEHRI & CO. Inc.**

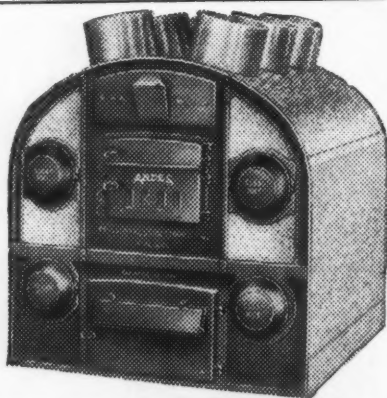
Tacoma, Washington  
1117 S. Tacoma Ave.

Syracuse, N. Y.  
400 N. Midler Ave.

## Mr. Dealer

Investigate the **ANDES** and its unusual dealer proposition. Here is a **real** merchandising idea.

Write  
today



**ANDES RANGE & FURNACE CORP., Geneva, N. Y.**



## Furnace Pokers

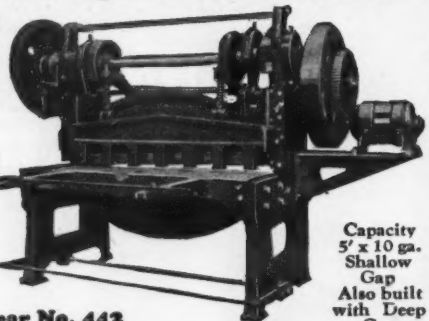
*Straight or Bent Point*

Plain or Japanned  
 $\frac{1}{2}$ "— $\frac{5}{8}$ " and  $\frac{3}{4}$ " diameter  
Lengths from 3 to 6 foot

Dept. F  
**FANNER MANUFACTURING CO.**  
BROOKSIDE PARK CLEVELAND, OHIO

## BERTSCH SQUARING SHEAR

Our Line  
Light and  
Heavy  
Machinery  
for all  
classes of  
Sheet Metal  
Plate and  
Structural  
Work



Squaring Shear No. 442

**BERTSCH & CO., Cambridge City, Ind.**

## FILE *this* COPY

When you finish reading American Artisan this month pass it on to others in your organization. Mark the articles in which they should be interested.

Then file it for future reference. You never know when you will encounter a problem in your business that is covered in this very issue.

## BUYERS' GUIDE

### AIR CLEANERS

American Air Filter Co., Inc., Louisville, Ky.  
Kleenaire Filter Co., Stevens Point, Wis.  
Owens-Illinois Glass Co., Toledo, Ohio

### AIR CONDITIONERS (See Unit Air Conditioners)

### AIR WASHERS

Gehrl & Co., Inc., A., Tacoma, Wash.  
Health Air Systems, Ann Arbor, Mich.  
Hess Warming & Vent. Co., Chicago, Ill.  
Meyer Furnace Co., The, Peoria, Illinois.

### BLAST GATES

Berger Bros. Co., Philadelphia, Pa.

### BLOWERS

Gehrl & Co., Inc., A., Tacoma, Wash.  
Health-Air Systems, Ann Arbor, Mich.  
Hess Warming & Vent. Co., Chicago, Ill.  
Henry Furnace & Fdy. Co., Cleveland, Ohio  
Meyer Furnace Co., The, Peoria, Illinois.

### BRAKES—BENDING

Dreis & Krump Mfg. Co., Chicago, Ill.  
Interstate Machinery Co., Chicago, Ill.

### BRAKES—CORNIC

Dreis & Krump Mfg. Co., Chicago, Ill.  
Interstate Machinery Co., Chicago, Ill.

### BRASS AND COPPER

American Brass Co., Waterbury, Conn.  
Revere Copper and Brass, Inc., Rome, N. Y.

### CASING RINGS—FURNACE

Forest City Foundries Co., Cleveland, Ohio.  
Peerless Foundry Co., Inc., Indianapolis, Ind.

### CASTINGS—MALLEABLE

Berger Bros. Co., Philadelphia, Pa.  
Fanner Mfg. Company, Cleveland, Ohio

### CEILINGS—METAL

Globe Iron Roofing & Corrugating Company, Cincinnati, Ohio  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### CEMENT—FURNACE

Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Northwestern Stove Repair Co., Chicago.

### CHAIN—FURNACE

Hart & Cooley Mfg. Co., Chicago, Ill.  
Russell Mfg. Co., Inc., The John M., Naugatuck, Conn.

### CHAPLETS

Fanner Mfg. Company, Cleveland, Ohio

### CLEANERS—FURNACE VACUUM

Breuer Elec. Mfg. Co., Chicago, Ill.  
National Super Service Co., Toledo, Ohio  
Northwestern Stove Repair Co., Chicago.  
Raney Mfg. Co., The, Columbus, Ohio.

### CONDUCTOR ELBOWS AND SHOES

Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Brown Wales Co., Boston, Mass.  
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### CONDUCTOR FITTINGS

Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Brown Wales Co., Boston, Mass.  
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### CONDUCTOR PIPE

Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Brown Wales Co., Boston, Mass.  
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### CONTROLS, FURNACE

Automatic Humidifier Sales Co., Detroit, Mich.

### COPPER

American Brass Co., Waterbury, Conn.  
Brown Wales Co., Boston, Mass.  
Revere Copper & Brass, Inc., Rome, N. Y.

### CORNICES

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio  
Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### CRIMPING MACHINES

Bertsch & Company, Cambridge City, Ind.  
Interstate Machinery Co., Chicago, Ill.

### CUT-OFFS—RAIN WATER

Barnes Metal Products Co., Chicago, Ill.  
Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### DAMPERS—QUADRANTS— ACCESSORIES

Aeolus Dickinson, Chicago, Ill.  
Hart & Cooley Mfg. Co., Chicago, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City  
Parker-Kalon Corp., New York, N. Y.  
Young Ventilating Co., Cleveland, Ohio

### DIFFUSERS—AIR DUCT

Aeolus Dickinson, Chicago, Ill.

### DRIVE SCREWS—HARDENED METALLIC

Interstate Machinery Co., Chicago, Ill.  
Parker-Kalon Corp., New York

### EAVES TROUGH

Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Brown Wales Co., Boston, Mass.  
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### EAVES TROUGH HANGERS

Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### FANS—FURNACE

A-C Mfg. Company, Pontiac, Illinois  
Gehrl & Co., Inc., A., Tacoma, Wash.

### FILTERS—AIR

American Air Filter Co., Inc., Louisville, Ky.  
Kleenaire Filter Co., Stevens Point, Wis.  
Lakeside Co., Hermansville, Mich.  
Owens-Illinois Glass Co., Toledo, Ohio

### FILTERS—FURNACE

American Air Filter Co., Inc., Louisville, Ky.

Gehrl & Co., Inc., A., Tacoma, Wash.  
Kleenaire Filter Co., Stevens Point, Wis.  
Lakeside Co., Hermansville, Mich.  
Owens-Illinois Glass Co., Toledo, Ohio

### FITTINGS, PIPE, GAS STOVE

Fanner Mfg. Co., Cleveland, Ohio.



# BUYERS' GUIDE

## FLUXES—SOLDERING

Kester Solder Company, Chicago, Ill.

## FORMING ROLLS

Bertsch & Company, Cambridge City, Ind.  
Interstate Machinery Co., Chicago, Ill.

## FURNACE CLEANERS

(See Cleaners—Furnace Vacuum)

## FURNACES FOR GAS OR OIL

Health-Air Systems, Ann Arbor, Mich.  
Henry Furnace & Foundry Co., Cleveland, Ohio.

## FURNACES—GAS

Forest City Foundries Co., Cleveland, Ohio  
Henry Furnace & Foundry Co., Cleveland, Ohio  
Lennox Furnace Co., Marshalltown, Iowa  
Meyer Furnace Company, Peoria, Ill.  
Payne Furnace and Supply Co., Beverly Hills, Calif.

## FURNACES—GAS AUXILIARY

Forest City Foundries Co., Cleveland, Ohio

## FURNACES, GAS SOLDERING

Interstate Machinery Co., Chicago.

## FURNACES—OIL BURNING

Meyer Furnace Co., The, Peoria, Illinois.  
Motor Wheel Corp., Heater Div., Lansing, Mich.  
Peerless Foundry Co., Indianapolis, Ind.

## FURNACES—WARM AIR

(See Also Unit Air Conditioners)

Agricola Furnace Co., Gadsden, Ala.  
Andes Range & Furnace Corp., Geneva, N. Y.  
Deshler Foundry & Machine Works, Deshler, Ohio  
Forest City Foundries Co., Cleveland, Ohio  
Health-Air Systems, Ann Arbor, Mich.  
Henry Furnace & Fdy. Co., Cleveland, Ohio  
Hess Warming & Vent. Co., Chicago, Ill.  
Lennox Furnace Co., Marshalltown, Iowa  
May-Fiebeger Co., The, Newark, Ohio.  
Meyer Furnace Co., The, Peoria, Illinois  
Motor Wheel Corp., Heater Div., Lansing, Mich.  
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.  
Payne Furnace & Supply Co., Beverly Hills, Calif.  
Peerless Foundry Co., Indianapolis, Ind.

## GRILLES

Harrington & King Perforating Co., Chicago, Ill.  
Hart & Cooley Mfg. Co., Chicago, Ill.  
Independent Register & Mfg. Co., Cleveland, Ohio.  
Meyer & Bro. Co., F., Peoria, Ill.  
Rock Island Register Co., Rock Island, Ill.

## GUARDS—MACHINE AND BELT

Harrington & King Perforating Co., Chicago, Ill.

## HANDLES—BOILER

Berger Bros. Co., Philadelphia, Pa.

## HANDLES—FURNACE DOOR

Fanner Mfg. Co., Cleveland, Ohio.

## HANDLES—SOLDERING IRON

Parker-Kalon Corp., New York, N. Y.

## HEATERS—CABINET

Agricola Furnace Co., Gadsden, Ala.  
Motor Wheel Corp., Heater Div., Lansing, Mich.  
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.  
Payne Furnace & Supply Co., Beverly Hills, Calif.

## HEATERS—GAS CABINET

Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.  
Payne Furnace & Supply Co., Beverly Hills, Calif.

## HEATERS—SCHOOL ROOM

May-Fiebeger Co., The, Newark, Ohio.  
Meyer Furnace Company, The, Peoria, Ill.  
Peerless Foundry Co., Indianapolis, Ind.

## HUMIDIFIERS

Automatic Humidifier Sales Co., Detroit, Mich.  
Columbus Humidifier Co., Columbus, Ohio.  
Hess Warming & Vent. Co., Chicago, Ill.  
Lakeside Co., Hermansville, Mich.  
Meyer & Bro. Company, F., Peoria, Ill.  
Sallada Mfg. Co., Minneapolis, Minn.

## MACHINERY—CULVERT

Bertsch & Co., Cambridge City, Ind.  
Interstate Machinery Co., Chicago, Ill.

## MACHINERY—REBUILT AND USED

Interstate Machinery Co., Chicago, Ill.

## MACHINES AND TOOLS—SHEET METAL WORKING

Bertsch & Company, Cambridge City, Ind.  
Brown Wales Co., Boston, Mass.  
Dreis & Krump Mfg. Co., Chicago, Ill.  
Interstate Machinery Co., Chicago, Ill.  
Marshalltown Mfg. Co., Marshalltown, Iowa.  
Parker-Kalon Corp., New York, N. Y.  
Viking Shear Co., Erie, Pa.  
Whitney Mfg. Co., W. A., Rockford, Ill.

## METAL LATH—EXPANDED

Barnes Metal Products Co., Chicago, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

## MITERS

Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

## NAILS—HARDENED MASONRY

Interstate Machinery Co., Chicago, Ill.  
Parker-Kalon Corp., New York, N. Y.

## PERFORATED METALS

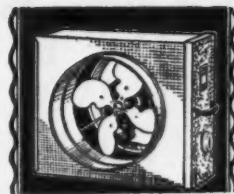
Harrington & King Perforating Co., Chicago, Ill.

## PIPE AND FITTINGS—FURNACE

Henry Furnace & Fdy. Co., Cleveland, Ohio.  
Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Peerless Foundry Co., Indianapolis, Ind.

## POKERS—FURNACE

Fanner Mfg. Co., Cleveland, Ohio.  
Henry Furnace & Foundry Co., Cleveland, Ohio.  
Independent Reg. & Mfg. Co., Cleveland, Ohio.



Write for full information and our catalog.

There is profitable business ahead of you in the next few months in heat boosters. Go after this business with the

**A-C**  
Thermostatically Controlled  
**Automatic HEAT BOOSTER**

A-C MANUFACTURING CO.  
417 Sherman Ave. Pontiac, Ill.

## FURNACE MANUFACTURERS KNOW "SIMPLEX" VALUES

That's why daily more manufacturers are adopting SIMPLEX as the standard humidifier. It will pay you to investigate.

## SALLADA MANUFACTURING CO.

720 South 4th St., Minneapolis, Minn.



"SIMPLEX"  
Truly Automatic—

## CHAIN AND S-HOOKS

For furnace damper regulators, thermostats, furnace clocks, skylights and ventilators. Put up 250, 500 or 1,000 feet to the reel, or in boxes to desired length. Furnished, if desired, coppered, sheradized or hot galvanized to prevent rusting.

WRITE US FOR PRICES  
THE JOHN M. RUSSELL  
MFG. COMPANY, INC.  
901 Rubber Avenue  
NAUGATUCK, CONN.



Single Jack Chain



Safety Chain

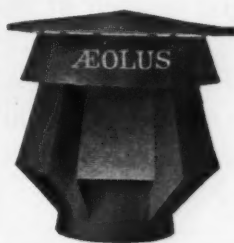


Sash Chain



Register Chain

Install



## AEOLUS Improved VENTILATORS

FOR industrial buildings, schools, homes, theaters, etc. Made in 14 different metals. Constant ventilation—no noise—no upkeep.

AEOLUS DICKINSON  
Industrial Division of Paul Dickinson, Inc.

3332-52 South Artesian Avenue  
Chicago, Ill.

Write today for  
folder and discounts  
**LIST PRICE \$15.00**  
Complete ready to install

## NEW MODEL "C" COLUMBUS HUMIDIFIER



THE COLUMBUS HUMIDIFIER CO.  
154 N. FIFTH ST. COLUMBUS, OHIO

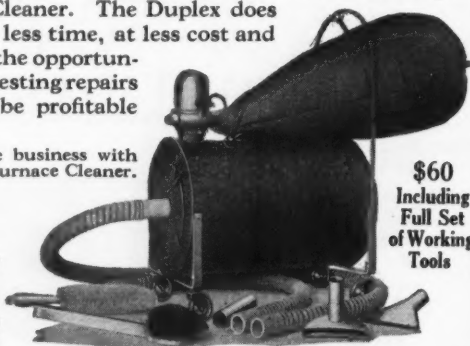
### RIGHT NOW IS DUPLEX TIME!

Right today, money is being made with the Duplex Furnace Cleaner. The Duplex does the job in less time, at less cost and gives you the opportunity of suggesting repairs that will be profitable to you.

Build future business with the Duplex Furnace Cleaner.

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literature

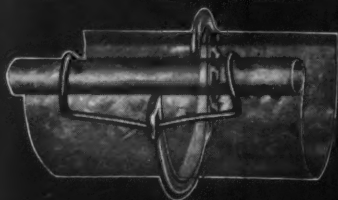
The Ramey  
Mfg. Co.  
Columbus  
OHIO



\$60  
Including  
Full Set  
of Working  
Tools

### "BB" QUALITY

Order  
from  
your  
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Saves  
time and  
labor

### "BB" SPRING CIRCLE CLIP

Furnished only with "BB" Circles at  
no extra charge over old style straps.

**BERGER BROTHERS CO.**

229-237 Arch Street, Philadelphia, Pa.

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your subscription, why  
not save yourself \$1.00  
by ordering two years  
for \$3.00, or better,  
save yourself \$2.00  
and order three years  
for \$4.00.

## BUYERS' GUIDE

### PRESSES

Dries & Krump Mfg. Co., Chicago, Ill.

### PULLEYS—FURNACE

Hart & Cooley Mfg. Co., Chicago, Ill.

### PUNCHES

Bertsch & Co., Cambridge City, Ind.  
Interstate Machinery Co., Chicago, Ill.  
Parker-Kalon Corp., New York, N. Y.  
W. A. Whitney Mfg. Co., Rockford, Ill.

### PUNCHES—COMBINATION BENCH AND HAND

Interstate Machinery Co., Chicago, Ill.  
Parker-Kalon Corp., New York, N. Y.

### PUNCHES—HAND

Interstate Machinery Co., Chicago, Ill.  
Parker-Kalon Corp., New York, N. Y.  
W. A. Whitney Mfg. Co., Rockford, Ill.

### RADIATOR CABINETS

Hart & Cooley Mfg. Co., Chicago, Ill.  
Meyer & Bro. Co., F., Peoria, Ill.  
Revere Copper & Brass, Inc., New York City.

### REGISTERS

Forest City Foundries Co., Cleveland, Ohio.  
Hart & Cooley Mfg. Co., Chicago, Ill.  
Henry Furnace & Fdy. Co., Cleveland, Ohio.  
Independent Register & Mfg. Co., Cleveland, Ohio.  
Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Peerless Foundry Co., Indianapolis, Ind.

### REGISTERS—WOOD

Auer Register Co., Cleveland, Ohio.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### REGULATORS AND LOCKS, VOLUME DAMPER

Young Ventilating Co., The, Cleveland, O.

### REGULATORS—AUTOMATIC HEAT

Cook Electric Co., Chicago, Ill.  
Hart & Cooley Mfg. Co., Chicago, Ill.  
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

### REPAIRS—STOVE AND FURNACE

Brauer Supply Co., A. G., St. Louis, Mo.  
Des Moines Stove Repair Co., Des Moines, Iowa.  
National Foundry & Furnace Co., Dayton, Ohio.  
Northwestern Stove Repair Co., Chicago, Ill.  
Peerless Foundry Co., Indianapolis, Ind.

### RIDGING

Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### RINGS—FURNACE CASING

Forest City Foundries Co., Cleveland, Ohio.

### ROOF FLASHING

Barnes Metal Products Co., Chicago, Ill.  
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### ROOFING—IRON AND STEEL

American Rolling Mill Co., Middletown, Ohio.  
Barnes Metal Products Co., Chicago, Ill.

Brown Wales Co., Boston, Mass.

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio.

Inland Steel Company, Chicago, Ill.

Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

Newport Rolling Mill Co., The, Newport, Ky.

Republic Steel Corp., Youngstown, Ohio.

### ROOFING—TIN AND TERNE

Berger Bros. Co., Philadelphia, Pa.  
Brown Wales Co., Boston, Mass.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Newport Rolling Mill Co., Newport, Ky.  
Republic Steel Corp., Youngstown, Ohio.

### RUBBISH BURNERS

Hart & Cooley Mfg. Co., Chicago, Ill.

### SCREWS—HARDENED METALLIC DRIVE

Interstate Machinery Co., Chicago, Ill.  
Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Parker-Kalon Corp., New York City.

### SCREWS—HARDENED SELF TAPPING SHEET METAL

Interstate Machinery Co., Chicago, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Parker-Kalon Corp., New York City.

### SCREENS—PERFORATED METAL

Harrington & King Perforating Co., Chicago, Ill.

### SCUPPERS

Aeolus Dickinson, Chicago, Ill.

### SHEARS—HAND AND POWER

Dries & Krump Mfg. Co., Chicago, Ill.  
Interstate Machinery Co., Chicago, Ill.  
Marshalltown Mfg. Co., Marshalltown, Iowa.  
Viking Shear Company, Erie, Pa.  
Whitney Mfg. Co., W. A., Rockford, Ill.

### SHEET METAL SCREWS— HARDENED, SELF- TAPPING

Interstate Machinery Co., Chicago, Ill.  
Parker-Kalon Corp., New York City.

### SHEETS—ALLOY

Inland Steel Company, Chicago, Ill.  
International Nickel Co., New York, N. Y.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Newport Rolling Mill Co., Newport, Ky.  
Republic Steel Corp., Youngstown, Ohio.

### SHEETS—BLACK, CORRUGATED, GALVANIZED

American Rolling Mill Co., Middletown, Ohio.  
Brown Wales Co., Boston, Mass.  
Granite City Steel Co., Granite City, Ill.  
Inland Steel Company, Chicago, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Newport Rolling Mill Co., Newport, Ky.  
Republic Steel Corp., Youngstown, Ohio.

### SHEETS—COPPER

American Brass Co., Waterbury, Conn.  
Brown Wales Co., Boston, Mass.  
Revere Copper & Brass, Inc., Rome, N. Y.

### SHEETS—COPPER BEARING STEEL

American Rolling Mill Co., Middletown, O.  
Granite City Steel Co., Granite City, Ill.  
Inland Steel Co., Chicago, Ill.

## BUYERS' GUIDE

Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Newport Rolling Mill Co., Newport, Ky.  
Republic Steel Corp., Youngstown, Ohio.

### SHEETS—COPPER (LEAD COATED)

American Brass Co., Waterbury, Conn.  
Revere Copper & Brass, Inc., Rome, N. Y.

### SHEETS—IRON

American Rolling Mill Co., Middletown, O.  
Brown Wales Co., Boston, Mass.  
Granite City Steel Co., Granite City, Ill.  
Inland Steel Co., Chicago, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Newport Rolling Mill Co., Newport, Ky.  
Republic Steel Corp., Youngstown, Ohio.

### SHEETS—MONEL METAL

International Nickel Co., New York.

### SHEETS—NICKEL

International Nickel Co., New York.

### SHEETS—PURE IRON COPPER ALLOY

Inland Steel Co., Chicago, Ill.  
Newport Rolling Mill Co., Newport, Ky.

### SHEETS—REFINED OPEN\* HEARTH IRON

American Rolling Mill Co., Middletown, O.  
Republic Steel Corp., Youngstown, Ohio.

### SHEETS—SPECIAL FINISH

American Rolling Mill Co., Middletown, O.  
Inland Steel Company, Chicago, Ill.  
Newport Rolling Mill Co., Newport, Ky.  
Republic Steel Corp., Youngstown, Ohio.

### SHEETS, STAINLESS STEEL

Brown Wales Co., Boston, Mass.  
Republic Steel Corp., Youngstown, Ohio.

### SHINGLES AND TILE—METAL

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### SKYLIGHTS

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio.  
Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### SNOW GUARDS

Berger Bros. Co., Philadelphia, Pa.

### SOLDER

Brown Wales Co., Boston, Mass.  
Kester Solder Co., Chicago, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### SOLDER—ACID CORE

Kester Solder Co., Chicago, Ill.

### SOLDER—ROSIN CORE

Kester Solder Co., Chicago, Ill.

### SOLDER—SELF-FLUXING

Kester Solder Co., Chicago, Ill.

### STARS—HARD IRON CLEANING

Fanner Mfg. Company, Cleveland, Ohio.

### STOVE PIPE AND FITTINGS

Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

### STOVE AND FURNACE TRIMMINGS

Fanner Mfg. Co., Cleveland, Ohio.

### STRAINERS—ROOF

Barnes Metal Products Co., Chicago, Ill.

### STRAPS—ORNAMENTAL PIPE

Barnes Metal Products Co., Chicago, Ill.

### TINPLATE

Berger Bros. Co., Philadelphia, Pa.  
Brown Wales Co., Boston, Mass.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.  
Republic Steel Corp., Youngstown, Ohio.

### TOOLS—TINSMITH'S

(See Machines & Tools—  
Tinsmith's)

### TRIMMINGS, FURNACE

Fanner Mfg. Co., Cleveland, Ohio.

### TRIMMINGS, INCINERATOR

Fanner Mfg. Co., Cleveland, Ohio.

### UNIT AIR CONDITIONERS

Andres Range & Furnace Corp., Geneva, N. Y.  
Forest City Foundries Co., Cleveland, O.  
Henry Furnace & Fdry. Co., Cleveland, O.  
Health-Air Systems, Ann Arbor, Mich.  
Hess Warming & Ventilating Co., Chicago, Ill.  
Lennox Furnace Co., Marshalltown, Iowa.  
May-Fiebeger Company, Newark, Ohio.  
Meyer Furnace Co., Peoria, Ill.  
Motor Wheel Corp., Lansing, Mich.  
Payne Furnace & Supply Co., Beverly Hills, Calif.

### VACUUM CLEANERS— FURNACE

(See Cleaners—Furnace Vacuum)

### VENTILATORS—CEILING

Hart & Cooley Mfg. Co., Chicago, Ill.  
Henry Furnace & Fdy. Co., Cleveland, O.  
Independent Reg. & Mfg. Co., Cleveland, Ohio.

### VENTILATORS—FLOOR

Aeolus Dickinson, Chicago, Ill.

### VENTILATORS—ROOF

Aeolus Dickinson, Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Jordan & Co., Paul R., Indianapolis, Ind.  
Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

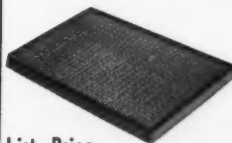
### WELDERS, SPOT

Interstate Machinery Co., Chicago.

### WOOD FACES—WARM AIR

Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

## THE New KLEENAIRE FILTER



List Price  
\$2.80 per Unit

## A PERMANENT DRY TYPE AIR FILTER

THE KLEENAIRE Filter was designed in answer to the demand for a permanent dry type air filter, with a price that would be most attractive to users. The Filter is encased in an all-metal exterior which will not bulge or warp out of shape. The filter media with its low resistance to air flow and high resistance to dust, can be cleaned by washing, tapping or vacuum.  
Write NOW for details.

KLEENAIRE FILTER CO.  
Stevens Point, Wisconsin

## FURNACE REPAIRS



To Fit  
All  
Makes of  
Furnaces

Quick  
Service  
by Express  
Freight or  
Truck

SEND FOR OUR NEW CATALOG  
**THE PEERLESS FOUNDRY COMPANY**  
INDIANAPOLIS INDIANA

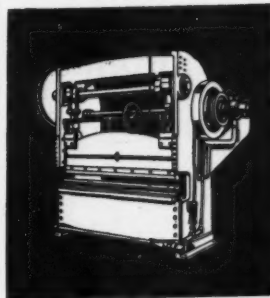
## NEW PROFITS FOR FURNACE MEN NOW

ASK FOR COMPLETE  
INFORMATION ABOUT

# NIAGARA

GAS AND COAL WARM AIR  
**FURNACES**

THE FOREST CITY FOUNDRIES COMPANY  
Cleveland, Ohio



Press Brake



Hand Bending Brake

STEEL BRAKES—PRESSES—SHEARS

**DREIS & KRUMP MFG. CO.**

7404 LOOMIS BLVD.

CHICAGO



## W H I T N E Y

### Hand Punch No. 6



for STANDING SEAMS  
for BUTTON PUNCHING  
for SKYLIGHT WORK  
for VENTILATING WORK  
for THE HUNDRED AND ONE  
ODD JOBS THAT COME  
INTO THE MODERN SHEET  
METAL SHOP!

Ask Your Jobber

W. A. WHITNEY MFG. COMPANY  
636 RACE STREET ROCKFORD, ILL.



## Does FURNACE CLEANING Really Pay?

These men say it does pay them, with their strong, handy, quick, one-man machines.

Cleanings paid them well, plus all these good sales:

| CLEANINGS | NEW PLANTS | REPAIR PARTS | OVERHAULS |
|-----------|------------|--------------|-----------|
| 100       | .12        | ...          | ...       |
| 304       | 7          | 87           | 26        |
| 800       | 5          | 500          | 40        |
| 651       | 42         | 175          | 200       |
| 204       | 21         | 62           | 15        |



The new model; lighter, more compact; same husky motor, 1/2 H. P. plus; suction 60% more; new style big bag; suit-case bag, clean, for upstairs, extra; full line of tools; prices lower.

With A tools.....\$131  
With B tools.....151

And these in a year which was poor for general business. Each of these firms, names on request, used only one Super Suction.

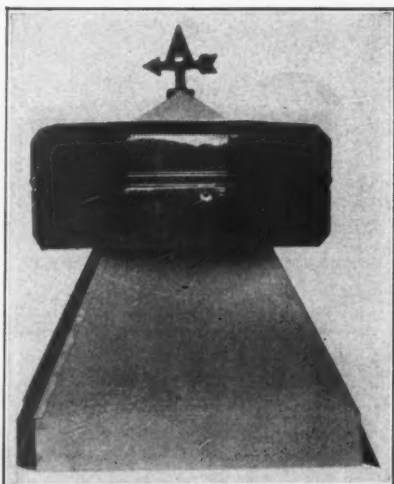
Do you know of any other thing that will bring in new business at that pace? Would you like to see the Plan Book which they used? It is free, and shows

how they got these sales. Do you know how you can first try this good Super Suction before you decide to keep it? And then to let it pay for itself? Easy.

Send this clipping with your name and address on it, to

The NATIONAL SUPER SERVICE CO.  
1944 NORTH 13th STREET TOLEDO, OHIO

## The JORDAN ATTIC VENTILATOR



Straight flaring base. Sets low and looks well. Operated by gravity and wind action.

The Jordan Attic Ventilator presents an opportunity which offers profits to you *right now*. Write for information. There is summer business to be had and you can get it.

Also Fan Ventilators, Rotary Ventilators, Stationary Ventilators, Wall Exhaust Fans, etc.

BACKED BY A COMPLETE ENGINEERING SERVICE.

**PAUL R. JORDAN CO.**  
631 S. Delaware St., Indianapolis, Ind.



ONE of the few really famous hotels in America ... providing faultless service for the comfort and happiness of those who appreciate the refinements of gracious living ... a traditional exclusiveness in the very center of Philadelphia's business and social life.

Rates consistent with present times

**BELLEVUE  
STRATFORD**

PHILADELPHIA

CLAUDE H. BENNETT, General Manager

# CLASSIFIED ADVERTISING

## SITUATIONS OPEN

**WANTED SALESMAN—WE HAVE AN** attractive commission proposition open for salesmen of proven ability, who appreciate the opportunity in modern warm air heating and air conditioning field. Our line represents individuality, outstanding fuel economies—make it one of the most attractive selling propositions in the field today, for aggressive salesmen with engineering ability and sales energy. Include your complete experience and sales references with your application. Address Dail Steel Products Co., Lansing, Michigan.

**PRESS ROOM FOREMAN—MAN THOR-** oughly experienced in operation of Dies and Presses on stove work. State age, experience and wages expected. Steady employment for right man. James Graham Manufacturing Co., Newark, California.

**SALESMEN—LEADING MANUFACTUR-** er with line of cast and steel warm air furnaces, steam and hot water boilers and other heating supplies has territory open in Missouri, Iowa, Ohio and Illinois. Address Key 161, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

**WANTED—A-NUMBER-ONE SHEET** metal working foreman. Must be capable of doing neat bench work, laying out work and doing outside work. Give reference and state age. Job located in central Illinois. Address Key 162, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

## Salesmen

traveling Nebraska, Iowa, Missouri and the Southern States calling on the furnace trade can make good commissions selling our line of blowers and air washers. Ours is a quality line and we can use only quality men. Address Key 165, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

## SITUATIONS WANTED

**SITUATION WANTED BY FIRST CLASS** sheet metal worker. Would like to connect with some concern doing work all over the country. Sober, steady and reliable and good habits. Will stick to the concern I connect with. Address Key 168, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

**SITUATION WANTED—BY A COMPE-** tent heating man and sheet metal worker; can also do steam work and plumbing. Experienced in gravity and forced air. Can make layouts on either warm air or steam jobs. 25 years' experience; married; strictly sober and can come at once. Address Key 153, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

**SITUATION WANTED—BY SHEET** metal mechanic, experienced on general jobbing, gutter and shop repair work—warm air heating also pipe fitting. Address Key 152, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

**SITUATION WANTED—BY FIRST** class sheet metal worker. Can estimate work and lay out patterns. Expert furnace installer. Good salesman. Hardware experience. Best of references. Address Key 155, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

**SITUATION WANTED—ALL AROUND** sheet metal worker and furnace man. Prefer Wisconsin, Michigan or Illinois. Available immediately. Address Key 167, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

**SITUATION WANTED—A-1 SHEET** metal worker wishes situation in town or small city. Can handle all classes of tin and sheet metal work. Steady work more essential than wages. Address Metal Worker, 154 Oakland Avenue, Macon, Georgia.

**SITUATION WANTED—BY A SHEET** metal worker and furnace man. Best references; 38 years old; 22 years' experience. Address V. H. Worrell, 1033 Dawson Street, Waterloo, Iowa.

**A-1 SHEET METAL WORKER, PLUMBER** and heating man with Illinois and Wisconsin State license. Layout man on all lines. Prefer steady position by middle-aged man. Address Cal. W. Hurt, Box 384, DeKalb, Illinois.

**SITUATION WANTED—BY RELIABLE** heating and sheet metal worker. Long general experience in warm air heating, sheet metal work and plumbing. Can lay out heating systems of all kinds, figure and handle men. Neat and accurate with work. A-1 habits. Address Key 145, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

**SITUATION WANTED—BY A GENERAL** all-around tinner; small town or city preferred. Years of experience at tinning and furnace work; hardware clerk. Address "Tinner," Route 4, Box 182, Des Moines, Iowa.

**WANTED—POSITION BY FIRST CLASS** sheet metal worker. Can do anything in that line. Also, can do estimating and designing of dust and shaving collecting systems. Able to take complete charge of shop and show results. Address Arno Goethel, 20—8th St., N. E., Rochester, Minn.

**SITUATION WANTED—A-1 SHEET** metal and heating man with twenty years' experience. Can do plumbing; also welding, brazing and silver soldering. Have had experience on electric refrigerator experimental work. Can furnish reference. Address Key 130, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

**SITUATION WANTED—BY AN ALL** around sheet metal worker. Can handle any branch of the trade such as cornice, skylights, ventilation and hot air heating and conditioning. Can make estimates and run the shop, prefer a position with good hardware company or job shop. Will go any place. Address Key 139, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

## PARTNERS WANTED

**FIRST CLASS SHEET METAL WORKER** and furnace man with complete sheet metal working equipment and large suction furnace cleaner wants connection with partner who has good location and can sell. Will move anywhere. Address H. Cain, Rossville, Ill.

## FOR SALE

**FOR SALE—ONE EIGHT FOOT STEEL** brake. Address Key 159, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

**FOR SALE—OFFICE FIXTURES, IN-** cluding safe, adding machine, cash registers, and Uarco business system, also some tinner's tools. Address Jas. B. Crowley, Oelwein, Iowa.

**FOR SALE—FURNACE AND SHEET** metal business at far below cost; consisting of complete line of tools, 1½ ton Ford truck and office equipment. Can lease or buy building. An unusual opportunity for a party wishing to engage in business. Located in one of Indiana's best cities. Address Key 158, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

## LINES TO HANDLE

### District Sales Representatives

To salesmen of proven ability we offer a commission proposition in a few attractive territories. Trade paper advertising starts August issues. Write at once for details. Automatic Humidifier Sales Co., 6560 Cass Avenue, Detroit, Michigan.

## LINES WANTED

### Manufacturers' Agent

acquainted with every large furnace supply house in the territory from the Missouri River on the East to the Pacific Coast on the West can handle several good lines to advantage. Commission basis. In first letter give all information, including territory, prices and commissions. Address Key 166, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

## WANTED TO BUY

**WANTED—USED SUCTION FURNACE** cleaner. State make, age, condition and price. Address Trotter Hardware Company, East Liverpool, Ohio.

## BUSINESS CHANCES

**WANTED—EXPERIENCED MANUFACTUR-** er of heating equipment, familiar with accounting and finances, and capable managing large plant. Give complete information. Address Key 164, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

**WANTED—TO CORRESPOND WITH** party interested in manufacturing, in a modest way, metal tanks, boats and a low priced steel furnace. Address Key 163, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

## MISCELLANEOUS

### FULL SIZE PATTERNS FOR BOATS

Building up-to-date Outboard Boats, Canoes, Hunting and Fishing Boats with our full size paper patterns.

Sectional or One-Piece  
Write for Free Illustrated Folder No 11  
H. F. THOMPSON Boat and Pattern Works  
Decorah, Iowa. Dept. A.

### Patents and Trade Marks

Philip V. W. Peck  
Barrister Bldg., Washington, D. C.



Blower

## Air Conditioning

• The Health Air Blower A Complete Air Conditioner •  
for New or Old Installations

Low Priced Write for our Attractive Proposition Efficient  
HEALTH AIR SYSTEMS, 1105 N. Main St., Ann Arbor, Mich.



Air Conditioner



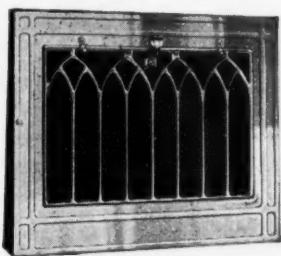


## Many Leading Installers Are Profiting By This Sales Method!

**I**NSTALLERS who lose sight of the fact that home-owners have to live with the registers installed in their home, day in and day out, also lose sight of the fact that registers can be made to play an important role in clinching sales.

Many a wise one, however, realizing that the matter of registers is vitally interesting to the prospect, mounts his proposed H & C register on a sample board. Shows it to his prospects. Points with pride to its pleasing design, its extra air capacity, its superb finish and the careful skilled workmanship throughout; and thereby creates an impression of quality for the entire job.

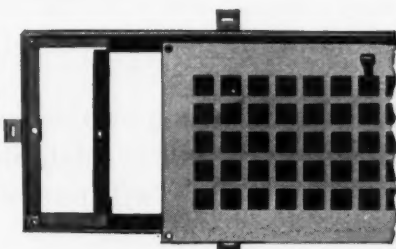
Put the extra quality of H & C registers to work for you. It costs you nothing, for H & C registers, in spite of their decided superiority, cost no more than others.



No. 110 Baseboard Register

### No. 3351 Side Wall Air Conditioning Register

Sets flush with plaster. One of a complete line built specifically for air conditioning.



**The Complete  
H & C Line Con-  
tains Registers  
Ideally Suited to  
every type of  
Installation.**

*Leading Jobbers Carry the H & C Line*



## HART & COOLEY MFG. CO.

General Sales Offices, 61 W. Kinzie St., Chicago

New Britain, Conn., Corbin Ave.  
Boston, 75 Portland Street

Philadelphia, Architects Bldg.  
New York, 101 Park Ave.

Registers for all purposes. Also a complete line of perforated and cast ornamental grilles, furnace regulators, dampers, pulleys, chain, and the H & C Automatic Heat Control.

## BETTER BUSINESS AHEAD

Hess Air Conditioner sales now will put you ahead this year—

**Hess  
Air  
Conditioner  
and  
Hess  
Welded  
Steel  
Furnace**



### More Profits

If your profits have fallen off for the first six months of 1932, you can still make substantial gains this year by selling the Hess Air Conditioner this summer. When days are hot and sticky, people will listen to your story about cool, comfortable homes with the Hess Air Conditioner.

### No Extras to Buy

The New Hess Air Conditioner is a complete unit, with beautiful green baked-enamel cabinet, consisting of air filter, blower, air washer and humidifier all built in. Can be installed with any make of heating system. Delivers a refreshing air circulation summer and winter; automatically controlled.

### New Hess Selling Plan

Many furnace dealers and heating contractors are adopting the new Hess Selling Plan, designed especially to meet 1932 conditions. This is an unusual plan—an exclusive merchandising idea which includes many practical features that mean sales. It is yours for the asking. Get busy NOW on air conditioning business—which is rightfully yours. Mail the coupon TODAY!

HESS WARMING & VENTILATING COMPANY  
1201-11 S. Western Avenue, Chicago

Send me full particulars about the Hess Air Conditioner, also your new selling plan.

Name .....

Address .....

I am a Furnace Dealer ☐ Sheet Metal Contractor ☐

# Billions of Dollars

## for

## *dependable employment*

**L**ARGE sums of money have been mobilized through the open market operations and the loan and discount facilities of the Federal Reserve Banks, and by loans through the Reconstruction Finance Corporation.

Here is a great credit reserve—totalling billions of dollars—awaiting dependable employment.

Just as fast as suitable jobs can be found for this credit, confidence will be strengthened, trade will quicken, and men will be returned to work.

To help speed the effective employment of this huge army of credit dollars, committees of leading industrialists and bankers

have been appointed by the Governors of the twelve Federal Reserve Banks—Boston, New York, Philadelphia, Cleveland, Richmond, Atlanta, Chicago, St. Louis, Dallas, Kansas City, Minneapolis and San Francisco.

Like the divisional staffs of a great army, these committees will work to consolidate our position, and straighten and strengthen our lines, so that a broad advance can be made.

Theirs is no simple task, but the readiness with which these industrial and banking leaders are joining together, and cooperating with national authorities, is a very encouraging factor in the present situation.



## ***Housing Construction — An Opportunity***

In previous depressions, a resumption of construction activity has been an important and vital factor in encouraging and stimulating business improvement. It assures employment of large numbers of men, not only directly, but also in the industries of supply.

There is undeniably an opportunity in many communities for construction of homes on a sound and economic basis, as well as a definite need for home repairs and improvements, and these matters will undoubtedly have early consideration.

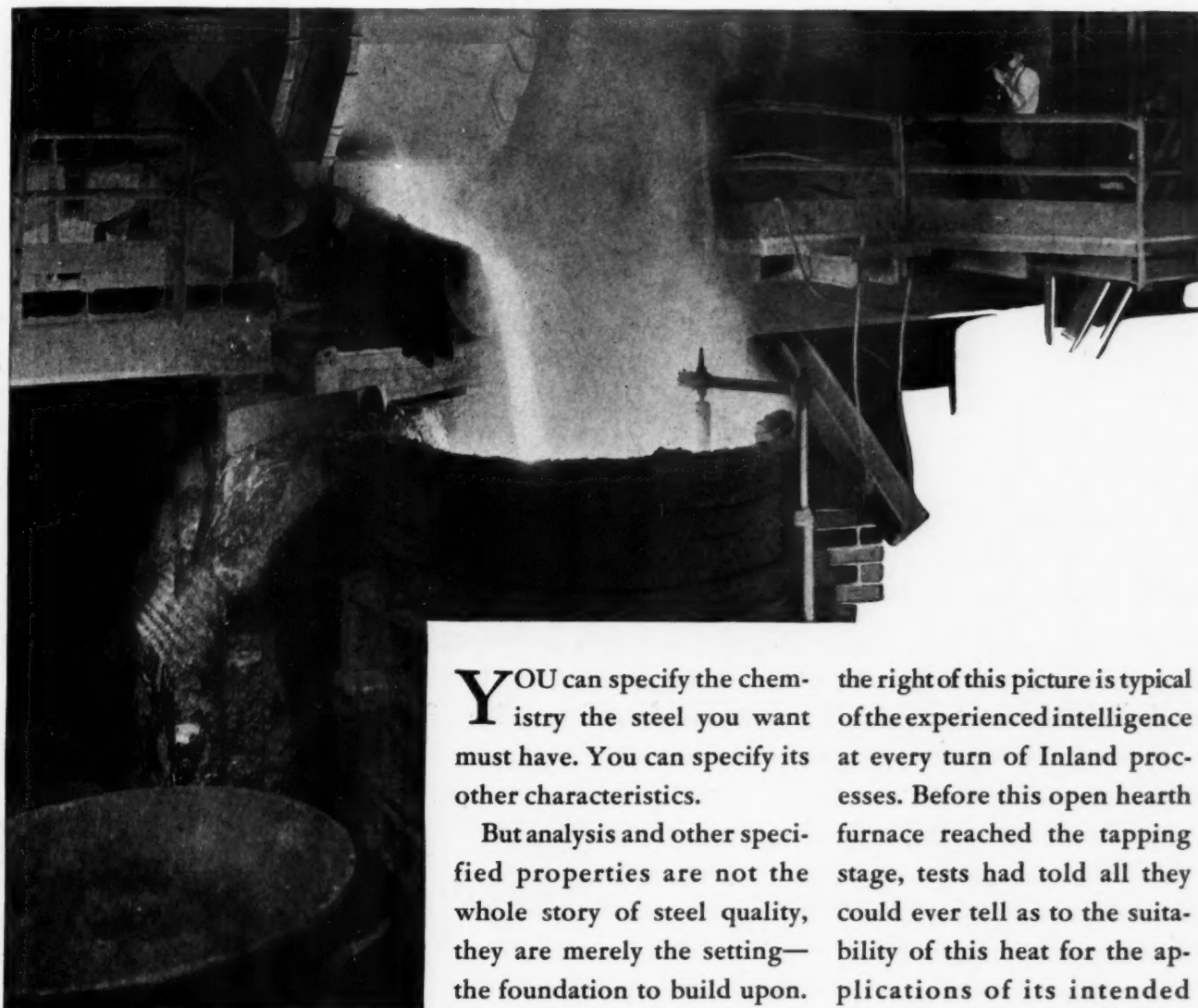
The bringing together of worthy domestic building projects and substantial financing is typical of the many possibilities for beneficial action open to these committees in a wide range of fields.

## **The National Publishers' Association**

*"As the most nearly self-contained nation, we have within our own boundaries the elemental factors for recovery."*

(From the Recommendation of the Committee on Unemployment Plans and Suggestions of the President's Organization on Unemployment Relief)

# HIS PRACTICED EYE PROTECTS YOU WHERE SPECIFICATIONS CANNOT



**Y**OU can specify the chemistry the steel you want must have. You can specify its other characteristics.

But analysis and other specified properties are not the whole story of steel quality, they are merely the setting—the foundation to build upon.

No tests known today can tell quite all of it either. Quality of steel is still finally determined by the experienced brains of the workmen who make it.

The metallurgist you see at

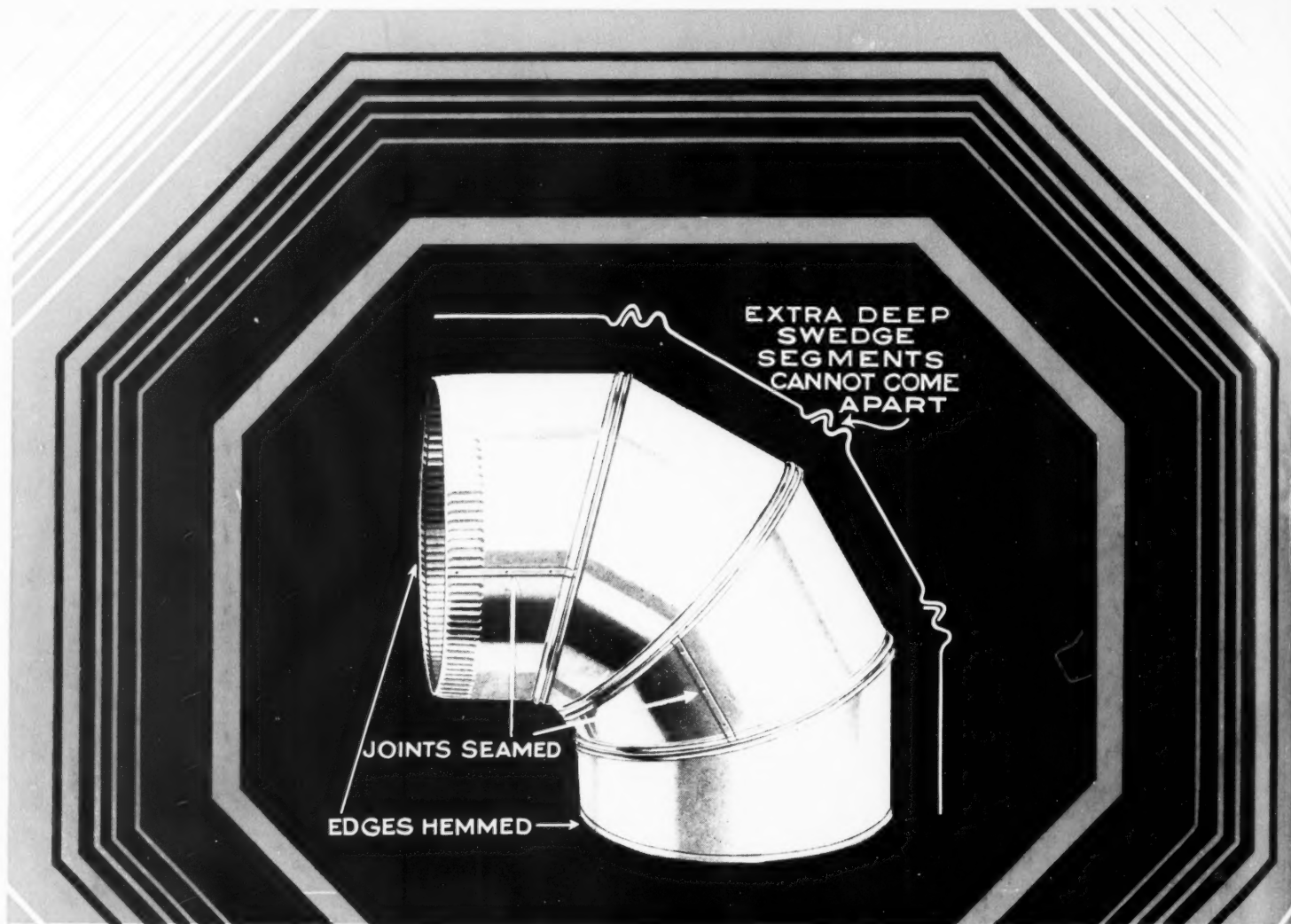
the right of this picture is typical of the experienced intelligence at every turn of Inland processes. Before this open hearth furnace reached the tapping stage, tests had told all they could ever tell as to the suitability of this heat for the applications of its intended buyer. But it remains for the metallurgist's practiced eye finally to judge whether this heat is satisfactory. **INLAND STEEL COMPANY**, 38 South Dearborn St., Chicago, Ill.

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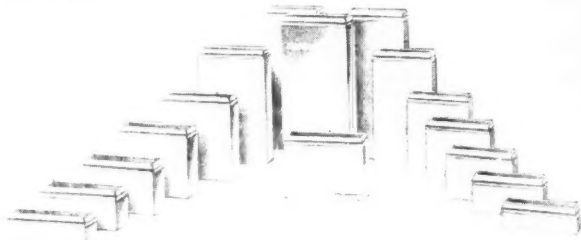


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